

# **NIRP Research for Policy Series 1**

**Technological change and rural third world women:  
an impact study in Machakos District, Eastern Kenya**

**Nurit Bird-David, Winnie Karugu, Mina Oduol (\*) and Simiyu Wandibba**

## Colophon

### **NIRP Research for Policy Series**

#### **Part 1: Technological change and rural third world women: an impact study in Machakos District, Eastern Kenya**

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CINADCO/Haigud

P.O. Box 30

Bet-Dagan 50200

Israel

Telephone: 972- (0)3 9485441/9485

Fax: 972- (0)3 9485761

E-mail: miriamb@moag.gov.il

H.J. Mastebroek (Secretary)

CIRAN, Nuffic

P.O. Box 29777

2502 LT The Hague

The Netherlands

Telephone: 31- (0)70 4260337/8

Fax: 31- (0)70 4260329

E-mail: hmbroek@nuffic.nl

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## Preface

This text evaluates the performance of the Sorghum and Millet Programme (SMIP) in the Machakos District of Eastern Kenya, paying particular attention to women in their households and community. The study was conducted by researchers from Israel and Kenya between April 1994 and August 1998. The project was funded by the Netherlands-Israel Development Research Programme (NIRP), which aims to encourage development-related research focused on socio-economic and cultural change. Being policy-oriented in nature, NIRP aims to make the results of research accessible to anyone interested in solving the problems investigated. The target groups for such knowledge include policy makers, representatives of non-governmental and donor organisations, and the scientific community. With this aim in mind, the Publication Board has launched the NIRP Research for Policy Series as a channel for the publication of “user-friendly” summaries of more than 30 scientific reports.

The Publication Board wishes to thank Dr. Mirjam A.F. Ros-Tonen for summarising the scientific report and editing this booklet. Thanks are also due to Mr. Robert R. Symonds for revising the English.

Last but not least, the Publication Board wishes to thank the research team for the successful completion of this study, which was carried out under difficult conditions. It would like to pay particular tribute to Wilhelmina Oduol, who died so tragically. The research team dedicated the final report, on which this booklet is based, to “Mina Oduol who started the project with us and died before it was completed. Her interests inspired this work and its findings”.

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# I. General information

## I.1 Framework of the study

This report is based on a study carried out in the Machakos District in the Eastern Province of Kenya for the purpose of evaluating the performance of the Sorghum and Millet Improvement Program (SMIP). The Government of Kenya introduced this programme in 1978 to help alleviate food shortages in the arid and semi-arid lands of Eastern Kenya. The aim was to introduce genetically improved varieties of indigenous drought-resistant crops of sorghum (*Sorghum bicolor*) and millet (*Pennisetum americanum*) with an accompanying technological package. The production of these crops had severely declined over the past decades in favour of newly imported cash crops such as maize.

The study paid particular attention to women within their households and community, as a means of gaining an insight into the performance and problems of SMIP. This was considered critical, as women have traditionally been responsible for farming work, while a significant proportion of them now also manage the farms because of the increasing out-migration of the male population to urban areas. The project was concerned, in particular, with differences between women in male-headed households, female-operated households (where husbands are temporarily away) and female-headed households.

Finally, the project addressed the cultural perceptions and indigenous knowledge of the rural people concerned, mainly Akamba (Box 1). Particular attention was paid to cultural differences between development donors and recipients, with reference to deep-rooted and sometimes unconscious assumptions.

The Machakos District comprises eleven administrative divisions, covering a total area of 6,051 km<sup>2</sup>. It has a population of 765,008 (CBS, 1989), the majority (97%) of whom are Akamba. The project focused on the six divisions within Machakos District that are located in the arid and semi-arid areas and in which domestic cultivation of sorghum and millet was in evidence. The average annual rainfall in this area ranges from 500-1,300 mm

and droughts occur frequently, resulting in the failure of maize crops and subjecting the local population to dependency on food relief programmes and famine. The study involved 303 Akamba households in 26 villages in the divisions of Yatta, Masinga, Mwala, Yathui, Kalama and Central.

## 1.2 Objectives

The first objective of this study was to give a sense of the realities in which women in these areas live at present, as a means of evaluating SMIP performance. The study sought to portray the constraints women face within their households, within the local community and the state, and the strategies they devise within their realities. A general objective embodied in this locally oriented objective was to help counteract homogenised images of “Third World rural women”, “subsistence farming” and “food security”, which are blind to differences in space and time. Even if women are targeted, sweeping stereotypes can hinder the success of development projects.

An evaluation of the performance of SMIP was the second objective of the project. The aim was to study the extent to which the programme succeeded in re-introducing sorghum and millet cultivation, consumption and marketing. The goal was to diagnose social and cultural bottlenecks arising from local practices and perceptions and from planners’ cultural misperceptions. Accordingly, the project sought gender and culture-sensitive recommendations for improving the programme.

Intertwined with the first two objectives, the third one was to develop a methodological package that would facilitate an evaluation study to consider the cultural, communal and domestic contexts in which rural people reason, make decisions and devise strategies. In contrast with market-oriented evaluation studies, such approach looks at domestic and economic work and household structures in an integrated way.

## 1.3 Hypotheses, research questions and methodology

With regard to the realities of gender in Machakos, the project addressed common widespread representations and tested the following hypotheses:

1. There is a strict gender-based division of labour, whereby women do most farming jobs.
2. A large percentage of the households depend on women, as many men emigrate to towns in search of employment.
3. The female-headed households and, to a lesser extent, the female-operated households, are economically the weakest.



SMIP was examined, in order to test the following hypotheses:

1. SMIP failed; farmers do not grow sorghum and millet, not to mention improved varieties of them.
2. Extension agents do not reach the rural farmers in the remote and under-developed semi-arid areas. They miss out women in particular and, therefore, female-headed and female-operated households.
3. Farmers do not use the recommended technological package.

The following questions informed the study about cultural perceptions and assumptions:

1. What indigenous farming knowledge do local farmers have?
2. How are sorghum and millet viewed within the local culture?
3. What is the local economic orientation: are late 20<sup>th</sup> century Machakos people subsistence farmers?
4. Do cultural assumptions informing SMIP tally with the local cultural orientation and, if so, how?

The research team used a methodological package which combines qualitative and quantitative methods, macro and micro perspectives, and a holistic attitude to culture. A survey at district level among 303 households was carried out with help of six Akamba with a rural farming background. Each one stayed with the family, helping them with their daily work and then completing with them an open-ended questionnaire.

A six-person survey team conducted a community profile at the 28 community centres to which the interviewed households were connected. By interviewing officials and other key persons, the teams mapped the community's economic infrastructure and facilities and studied its market, shopping and administrative structure.

In one community in the Yatta division, a year-long participant-observation study was carried out. Two assistants lived in the village, studying its everyday life and writing village diaries. The Kenyan researcher frequently visited and stayed in the village. The manifold aspects of the village's economic life were examined, as was the way in which other aspects of life such as politics, kinship, religion and symbolism bore on it.

The approach pursued has been indispensable for this analysis and, in this way, proved its own value. In addition, the ongoing cross-cultural dialogue among members of the research team was found to be a valuable research instrument in itself. It kept bringing to the surface deep-rooted differences between Kenyan and Israeli-Western assumptions, which could then be mediated.

#### 1.4 Theoretical orientation

The research was anchored in two theoretical traditions: development anthropology and development and women. Development anthropology since the 1970s has stressed the value of a holistic ethnographic study which pays attention to the socio-political and cultural contexts in which people live and act. It maintains that, in order to understand people's acts, resistance and preferences, it is necessary to gain a sense of how they themselves view the world and interpret what happens to and around them. After all, people as social beings conduct their lives within a culture, which shapes the meanings and significance of the world and what they do in it. The development apparatus itself, it has recently been argued, is affected by a cultural view of the world and a set of core symbolic ideas originating from a particular era of Western society and thought. Development "donors" approach targeted Third World "recipients" with their own culturally shaped truths, perceptions of reality, value hierarchies, and agendas. Current development anthropology pays attention to the cultural assumptions of both the "donors" and the "recipients", particularly to deep-rooted differences between the unconscious assumptions of each side. Since each side regards its own assumptions as "obvious" and "natural", these differences result in impasses that are difficult to understand.

Since the 1970s, "Development and women", through its various stages and schools, including "Women in Development" (WID), "Women and Development" (WAD) and "Gender and Development" (GAD), has promoted sensitivities to differences between men's and women's experiences. The early work (WID) stressed that women and men in the rural Third World have separate work spheres and that women performed a critical role as farmers (Boserup, 1970). This means that, for as long as only men were targeted - by a development machinery in which men were dominant - development could not help women, nor could it even take off. The call at this first stage was to bring women into the development process, so they might enjoy its fruits too, and help the process on. Subsequent work (WAD) called for setting up a separate development process for women, rather than incorporating them into existing development structures, as the only way to escape deep-rooted patriarchal dispositions in both the West and the Third World (Gilligan, 1982). Following this second call, the third and most recent one (GAD) has been to approach both men and women, while taking note of differences between them, within the single world in which they live (Feldstein *et al.*, 1989; Rao *et al.* (1991); Overholt *et al.*, 1985). This work does not simply advocate a return to the early call. It proposes addressing gender differences within the development process, whereas the early call

was to address women because they had been neglected.

Embodied in the gender concept that is used in this study is the insight that womanhood is not simply a matter of biology and nature. Womanhood is a cultural construct and a differently one at that, in each culture. Women's place and significance in each culture can, and do, change in history. "Gender and Development" advocates paying attention both to gender differences and to differences within gender (e.g. Gilligan, 1982; Spelman, 1990). Examples of this are the different experiences and perspectives of women (as a gender) in the different cultures (Sen and Grown, 1987; Parpart, 1995), classes (Ahmed, 1985; Whitehead, 1985) and social positions (Ventura Dias, 1985; Kitching, 1980; Paterson, 1980) in which they live.

Each of these traditions emphasises in its own way the importance of culture and the need to consider especially cross-cultural differences. Each, following its own path, has come to recognise in recent years the complexity of Third World rural realities and the diversity of the lived experiences of Third World peoples. Commonly, these approaches warn us against camouflaging development language, which by its use of generalising and naturalising terms (for instance "development", "Third World women") pre-empt a deeper understanding of particular situations (e.g. Mohanty, 1988). These approaches stress that there must be a dialogue between the viewpoints of the targeted development "recipients" – local people in general and women in particular – and those of the "development" personnel. The latter must not be regarded as universally valid and valuable.

The experiences of women in different types of households were compared in the light of these traditions. In both the survey and the participant-observation work, the research focused on local men *and* women. This enabled an analysis to be made of the real, everyday lives of women, and the relationships within which gender differences were articulated and reproduced.

### 1.5 Elaboration of the research

The development discourse abounds with stereotype representations of "Third World rural women" in general, and "African rural women" in particular. Theoretical orientations, traditional Akamba culture and participant observation suggested the need to depart from such filtering cliché's and to look at the lived experiences of Machakos people. It was considered important to observe and record the more complex reality and to hint at the diversity of African rural experiences. To this end, four "stories" – which can be regarded as hypotheses for empirical research – were tested.

The first “story” relates to women, households and labour in Machakos. The literature on “Gender and Development” (GAD) and “Women in Development” (WID) has put forward new images of social reality in rural Third World areas, in which not only men, but also women are visible. According to these images, many Third World rural areas are characterised by a strict gender division of labour and by gender-segregated spheres of life. In many cases, especially in Africa, women do most of the farming jobs. A high proportion of the households lack adult male members, as many men emigrate to towns in search of employment. The female-headed and, to a lesser extent, the female-operated households are economically the weakest. Women continue to fall behind, the more so as development programmes remain male-biased.

These assumptions were checked with help of five groups of questions. The household survey and participant observation enabled a closer look to be taken at the division of households into female-headed, female-operated and male-headed households; the gender division of labour; and the economic assets, human capital, and women’s control of resources per household type.

“Story” 2 refers to the development and gender performance of SMIP. According to accepted knowledge at the Centre (including views expressed by some administrative personnel in Machakos itself), SMIP had failed. The accepted “story” is that few farmers grow new varieties of sorghum and millet. They cannot afford to buy improved seeds and farm inputs such as pesticides and fertilisers. Many are unaware that the seeds and farm inputs exist. Consumers dislike the taste and colour of the new varieties, favouring the old varieties they are used to. Producers avoid growing sorghum, both old and new varieties, because this crop is susceptible to damage by birds and require constant guarding from them. Traditionally, it was the children who undertook this task, but nowadays the children go to school. Extension agents rarely reach the farmers in the remote and underdeveloped semi-arid areas. In any case, the farmers are conservative and resist innovations.

The “Women in Development” and “Gender and Development” traditions drew attention to the situation of women in terms of the following “story”. Development programmes too often target men, assuming they are heads of households and take care of the women and children. Credit facilities, agricultural training and technical advice are offered to men, to the exclusion of women. Extension agents, themselves mostly men, make contacts with male farmers. They then make evaluations that perpetuate the discrimination by again mainly focusing on men and male issues.

This twofold scenario is the second “story” that this study checks against Machakos and for which eight groups of questions were formulated.

Three groups of questions refer to sorghum and millet production, consumption, exchange and marketing. The remaining questions address the Programmes' performance in the disseminating of improved seeds, the use of the recommended technological package, the work of extension agents, new ways of sorghum and millet utilisation and the Programme's performance in gender terms.

The third "story" deals with agriculture and indigenous knowledge in Machakos. According to recent Development Anthropology literature, local farmers have their own "technology", consisting of intimate knowledge of the environment, born of generations of local practice. They expertly "read" the fluctuating signs it gives; their "technology" makes for flexible responses to such signs. They favour a diversity of practices, including seed variations, for stability of production over seasons and locations and reduced risks. This sometimes interferes with the acceptance of the standardised modern technology (seeds, methods, etc.) which development agents introduce.

This "story" was checked in Machakos, while gender-sensitising it, from participant observation. Questions that were asked referred to the nature of environmental signs used to "read" the start of rains, a coming drought, seasonality patterns and soil types and soil quality. A further check was made to see whether such indicators affected local decisions on cropping patterns and whether there were gender and age-based differences in indigenous knowledge.

The final "story" relates to food, culture and agriculture in Machakos. According to anthropological studies going back to the classic literature, culture – including perception, symbols and ethno-classifications – heavily influence food desirability and patterns of use. On the hypothesis that this was also the case with the Akamba – who constitute 97% of the Machakos people – the last group of research questions looked into the cultural perceptions and strategies relating to farming and trading, and the perceptions, symbolic connotations and traditional ceremonies specifically related to sorghum and millet.

### Box 1 The Akamba

Although their area has been open to outside influences for a long time, Kamba culture – the word Kamba covers the people (Akamba), one person (Mukamba), their language (Kikamba) and their country (Ukambani) – provides the context in which the area's people live and work. The Akamba are not, and never have been, subsistence farmers. They have a long history of involvement with trade. Partly because of the recurrent famines in the area, migration to coastal areas is common, bringing Akamba into direct contact with coastal towns and communities. Trade relationships with Arab and Swahili merchants, many of whose caravans reached their country, was reported in as early as 1823 by an English navy officer, who found an annual market where Akamba traders bought cattle, ivory and iron.

Local trade developed, too. Large markets were common in the 1940s. Many people, coming from a wide area, visited them. By the 1960s, there were market places all over the country, where people brought their farm produce, cattle, sheep or goats to sell for money or barter with other goods.

Akamba have traditionally also engaged in hunting and bee collecting. The area is rich in game, such as lions, elephants, antelope of many types, hares, giraffes and foxes. Hunting is the pursuit of men using bows and – often poisoned – arrows. Akamba value their hunting activities and have many folk tales about animals and hunting. Akamba also collect honey, which played an important role in their society, as it was used for making beer and preserving food. They also gathered wild fruits, vegetables, roots and leaves for food.

Keeping livestock is also basic to the Akamba economy. Livestock plays a central role in marriage arrangements and social life, when it is customary to slaughter a chicken, sheep, goat or bull as an expression of hospitality. Moreover, customary fines are usually paid in the form of animals. Milk is an essential part of Akamba diet. In many respects, livestock is a symbol of status and the Akamba have a great regard for it.

Interestingly, under British rule, Machakos Akamba showed little enthusiasm to emigrate for employment or engage in wage labour locally. Machakos Akamba managed to obtain the money they needed for paying taxes and other needs through trade. Men tended to remain on their farms with their families rather than leave their family to work elsewhere. The British finally discovered that one way to induce Akamba to enter their employment was to permit them to settle on their land with their cattle in return for rent paid in labour. This solved the British ranchers' labour problem, while the Akamba could stay together as a family.

Akamba cultivate sorghum, maize and millet and small quantities of legumes, pigeon peas and other types of peas and beans. They mix the crops in planting. Compared with their other economic activities, farming is marginal. Unlike many other groups in Kenya, Akamba belittle sorghum beer, being partial to beer made from honey and sugar cane. Neither are sorghum and millet important in ceremonies, often being displaced by goats and cattle.

The most basic social unit in Akamba life is *mosie*, which literally means "family" and "home". The family consists of parents, children, brothers, sisters, grandparents and often other relatives. Traditionally, marrying was a social obligation and anybody who did not marry was ridiculed and considered a social failure. A man can marry one or more women, depending on his economic capacity. Women remain living on their homestead until they get married, after which they move in with their husband's family.

Kinship through blood and betrothal plays an important role in Akamba life. There are about a hundred kinship terms in Kikamba. Society is perceived in terms of kinship: everyone knows how she or he is related to others. A Mukamba is not considered as an individual, but primarily as a member of the community.

The homestead or *shamba* is usually made up of several houses and grain stores, belonging to a man's several wives and children. On the same compound or nearby are the similar homesteads of his brothers and their families. The oldest member of the homestead, whether a man or a woman, is technically the "head of the homestead". (Sources: Buruchara, 1987; Kalule, 1987; Lambert, 1947; Lindblom 1916; Mbiti, 1966; Middleton, 1953; Munro, 1953; Ndeti, 1972; Osaga, 1987).

## II. Results

### II.1 Gender realities in Machakos

Addressing a common representation perpetuated in the literature, the study examined whether there was a strict gender-based division of labour in the Machakos District in the mid-1990s, with women doing most farming jobs. It was found that, although social life is highly segregated by gender, with men and women in each group associating largely among themselves, this is not generally so within the household. Division of labour appears to be much less pronounced than is suggested by the literature. In a surprising number of households, husbands and wives share work in production activities such as herding livestock, selling livestock and agricultural produce, running small businesses and shopping. What is most surprising is that crop cultivation, generally considered in the literature to be a “women’s task”, is carried out exclusively by women in only 40 (19%) of the 207 male-headed households. In 144 cases (70% of all male-headed households), men and women share the work.

Table 1 Division of labour by gender in sorghum production: male-headed households

| Task                                    | Male (%) | Female (%) | Both (%) | Others <sup>a</sup> (%) | None (%) | Total (%) |
|---|----------|------------|----------|-------------------------|----------|-----------|
| Land preparation                        | 12.2     | 16.1       | 63.4     | 4.4                     | 3.9      | 205       |
| Planting                                | 4.9      | 34.5       | 53.2     | 3.5                     | 3.9      | 203       |
| Use of improved technology <sup>b</sup> | 7.7      | 25.1       | 53.6     | 8.7                     | 4.9      | 183       |
| Weeding                                 | 2.9      | 23.0       | 67.6     | 2.5                     | 3.9      | 204       |
| Bird scaring                            | 10.3     | 27.9       | 13.9     | 24.9                    | 23.0     | 165       |
| Crop protection <sup>c</sup>            | 15.3     | 14.5       | 21.8     | 0.8                     | 47.6     | 124       |
| Harvest                                 | 3.1      | 55.2       | 36.5     | 0.5                     | 4.7      | 192       |
| Post harvest <sup>d</sup>               | 2.0      | 55.0       | 38.0     | 0.5                     | 4.5      | 200       |

<sup>a</sup> Children or employees

<sup>b</sup> Fertilising etc.

<sup>c</sup> Work to protect crops from pests other than birds

<sup>d</sup> Drying, threshing, storing the sorghum, etc.

Specific results for sorghum production are summarised in Table 1. They show that planting, use of improved technology and weeding are done more by women alone than by men alone, but that in more than half of the households these tasks are shared. Bird scaring is traditionally a children's task and this most likely continues to be the case. Where children cannot do it because they go to school, women tend to take it over or the task is not done at all. Unlike women, men rarely perform harvest and post-harvest activities alone, but in a significant proportion of the households, these tasks are shared. As for crop cultivation in general, the extent of gender task-sharing in sorghum production is remarkable.

In female-headed and female-operated households also, gender task sharing is striking. Other male members such as employees and sons help in place of the absent husband in farming tasks. Sons, for example, help in 68% of the female-headed households and in 64% of female-operated and male-headed households. Employees help in 36% of the female-operated households, compared to 22% in male-headed and 12% in female-headed households.

In all households, clear gender distinctions are still apparent as far as formal employment (wage labour) and domestic chores are concerned. Activities, which are performed only by women in most male-headed households, include collecting firewood (85% of the households), fetching water (79%), housework (90%) and rearing children (85%). In comparison with these characteristically women's tasks, wage labour is predominantly a man's occupation: only in one case are both the man and women engaged in formal employment.

The study further examined the extent of male out-migration and how it affects the labour conditions of the rural household. The hypothesis tested was that a high percentage of households depend on women, as many men migrated to towns in search of employment. It was found that the husband is present in 207 households (69%). In 61 households (20%), the husband is away working and the wife operates the household. In 34 households (11%), the husband is absent. These figures are lower than those found by Ventura-Dias one decade earlier (1985). She found elsewhere in Kenya that 27% of the households were female-headed and 21% were female-operated. This difference can be attributed to decreasing employment opportunities and migration to towns in recent years, as well as to Akamba culture, in which men resist going away for employment, as they consider it to be important for the family to stay together.

Female-headed households in Machakos largely comprise households headed by women who are, or say they are, widows (86%) or divorcees



(7%). The remaining 7% can be assumed to be unmarried, although it is hard to get this confirmed, as “unmarried” implies a derogatory status, carrying undesirable social consequences. Moreover, unmarried women and their children usually remain living with their parents, as married sons often do, too. When the sons marry, their wives join them. In this local situation of extended households, unmarried women are not visible. Contrary to what female-headed and female-operated household may imply in the Western context, in Machakos these are not necessarily households in which there are only adult females. They can include grown-up sons, brothers, sons-in-law and, in some cases, live-in employees. This implies that the fact that the husband is absent does not necessarily mean that a household is lacking in male labour and depends solely on women. This may also be the case in many other rural parts of Kenya, and it may have been overlooked owing to insufficient attention being paid to the cultural structure of social and economic life, especially to culture-specific meanings of universal categories such as “female-headed households”.

Another culture-sensitive aspect of the notion “household” is that Machakos and other Kenyan people consider relatives who work in town to be household members, even when these relatives have lived in town for many years and settled there. These relatives, in turn, consider the rural farmstead to be their “home”, where they build their own house, next to which they will be buried. The household, in this context, is not the residential unit of people living together on the farm. This study followed the respondents’ own perceptions of the household, which thus may include a large variety of relatives.

This aspect influences differences in the economic conditions of the Machakos households, which were compared in respect of material assets such as farming land, dwellings and luxury goods. Human capital was also considered, being reformulated to include kinship relationships carrying economic responsibility. The hypothesis tested was that the female-headed households and, to a lesser extent, the female-operated households, were economically the weakest. In contrast to this hypothesis, it was found that female-operated households had a strong material basis. Receiving money regularly from their husband (rather than being deserted), they are the most “developed” households by Western criteria, with the highest level of education, highest consumption of Western goods, and smallest numbers. For example, female-operated households own proportionally more houses built with modern technology (46% of the households) than male-headed households (30%) and female-headed households (15%). Female-operated households also own more luxury goods such as water tanks, stoves, sofa

sets, etc., than male-headed households, and far more than female-headed households. The latter are the most traditional in their living standards, living more often in traditionally constructed houses and lacking modern consumer goods (except for radios). However, in terms of their production assets, such as livestock and acreage of land and its legal ownership, they do not fall behind other households. More female-headed households (75%) receive help from out-farm household members working in town than do male-headed households (51%), but less than female-operated households (88% of the households). Moreover, women in female-headed households have a greater degree of control over the household's resources and feel a greater degree of security.

#### **Box 2 The Sorghum and Millet Improvement Program (SMIP)**

The Sorghum and Millet Improvement Program (SMIP) was initiated in 1978 to promote sorghum grains for human food while research on animal feed was in progress at the Lanet Research Station in the Rift Valley, where the government run a beef development project with FAO support. The SMIP has the following objectives (Kamau and O'Neil 1990; M'Ragwa and Kanyenji, 1987):

1. To develop varieties or hybrids that are stable, resistant to diseases and pests, have good food quality, and mature in a time frame appropriate to their area of cultivation.
2. To develop production technologies that conserve and optimise resource use and minimise cost and risk, while accommodating the social and economic constraints of small-scale farmers.
3. To develop methods of processing high-tannin varieties at the village level that are less prone to bird damage.
4. To undertake quality, processing and utilisation studies for the improvement of food varieties, which will increase demand and consequently enhance their position in the national economy.
5. To disseminate the results through training and on-farm testing, in collaboration with the extension service.

The scientists of the Research Stations recommend the following practices in the cultivation of sorghum and millet (Kamau and O'Neil, 1990; KARI/MIAC, 1997):

1. Dry planting in the arid and semi-arid lands around 20 October, that is, just before the short rains.
2. Row planting rather than broadcasting, at a depth of 5 cm.
3. Early thinning to avoid plant competition after 3 weeks.
4. Ratoon has advantages over fresh cropping in that it flowers 16 to 25 days earlier, thus escaping shoot-fly attack and cold temperatures in June and July.
5. Specific seed rates are recommended for each variety of each crop.
6. Specific varieties of each crop are recommended for each of the crop zones and areas where they are grown in Kenya. Recommended sorghum varieties for Machakos are S76 which matures in 3 months, is white in colour, and yields 10 bags per acre and KARI/MTAMA1, which matures in 3 or 3.5 months, is brown in colour, and yields 15 bags/acre. For millet, finger millet (KAT/FM1) is mostly recommended. It matures in 3 months, is brown in colour, and yields 7.5 bags/acre. There are also recommended varieties for pearl millet, proso millet and fox-tail millet. Seed companies commercially market both sorghum varieties and the finger millet variety KAT/FM1. The other millet varieties, although released, are not available on the market as certified seed but may be obtained from the KARI centres where they were improved, such as Katumani.

7. Farmers can select and use seed from the previous season for planting for up to four seasons before getting new certified seed, but they should ensure that no other unrelated varieties are grown in the same fields.
8. A fine seed bed.
9. Specific row spacing is recommended for different crops in different zones under mono cropping or intercropping conditions.
10. NPK fertiliser is recommended during planting and then top dressing with CAN after emergence. Specific compositions of NPK as well as application rates are detailed. In addition, the use of farmyard manure is recommended.
11. Weeding should be done 2-3 weeks after emergence and then once more after a further 2-3 weeks. Chemical weeding, using a herbicide, can be done before emergence.
12. For crop protection it is recommended that seed be treated with ferasan-D, while furadan should be used at planting to control shoot-fly and other soil pests. Marshal 250 EC or Diptrex are recommended to control stem borers, while Karate or Ambush are recommended against other pests, such as midge and aphids. For storage, substances such as actellic, malathion, or pythre-thrum dust, or even wood ash, could be used to control weevils. Alongside these chemicals – for which specific application rates are given – other crop protection measures are recommended. These include the use of resistant/tolerant varieties, field sanitation, timely uniform planting, use of well-decomposed manure, deep land preparation, bird scaring, crop rotation, early harvesting, proper grain drying, and the use of clean, well-ventilated and disinfected stores.
13. KARI also lists the commercial buyers of sorghums and millets:
  - the National Cereals and Produce Board (NCPB) for distribution;
  - UNGA Ltd. (Nakuru and Nairobi) for flour making;
  - the Kenya Industrial Research and Development Institute (KIRDI) in Kisumu, which processes white/brown millets and sorghum for products like Super Mtama – a rice-like sorghum – and
  - KUGURU Ltd. which processes white/brown sorghum for commercial beer.
14. KARI has also developed a wide range of recipes for whole sorghum, dehulled sorghum, and sorghum and millet flour. These include plain boiled grain, githeri or muthokoi, sorghum pilau, ugali, uji, sorghum chapatis, sorghum doughnuts, sorghum biscuits, sorghum cake, sorghum bread, sorghum muffins and sorghum tea. They also suggest that the stocks can be fed to livestock after harvest, as can bran and broken grain after winnowing during dehulling. KIRDI has successfully developed processes for supplementing wheat in commercial baking and barley in beer making, as well as a sorghum "rice."

## II.2 SMIP's performance

The aim of the Sorghum and Millet Improvement Program (SMIP) is to alleviate food shortages in the arid and semi-arid lands of Eastern Kenya. The direction it has taken – improving qualities of indigenous drought-resistant sorghum and millet plants and persuading the local population to grow the new varieties as their main crop – has been one of the few developments which do hold promise for Kenya, given the overall situation during the past two decades. Kenya's agricultural growth has been in constant decline, while its population has been constantly growing. This has generated food shortages, further aggravated by ecological calamities. Food relief in the arid and semi-arid lands, where the majority of people live, is frequently required.

The agricultural future for these lands, and for Kenya in general, lies with sorghum and millet, which can survive the region's harsh ecological conditions.

The locus of SMIP's scientific work is Katumani Research Station, situated near Machakos town in Machakos District. After several early failed attempts (see Kamau and O'Neil, 1990), Katumani eventually developed improved varieties particularly suitable for the arid and semi-arid lands in the Machakos and Kitui Districts and yielding up to 50% more than the old varieties. They were made available to the local population and technical advice was given through many local channels, including the many women's groups that operate in the area. However, these efforts were of little avail. Farmers grow very little sorghum, preferring maize at high local, national and international cost. Millet is hardly grown at all. But focusing on sorghum, the study detected a pattern that was perplexing in three ways, which refutes the hypothesis that Machakos farmers do not grow sorghum, let alone its improved varieties. Firstly, a large majority (89%) of the Machakos households grows sorghum. Secondly, an overwhelming majority of these (98%) know of, and grow, improved varieties of sorghum. Thirdly, however, farmers grow very little sorghum: on average 0.8 acres per farmer (the median being 0.50), which is less than 10% of the total land she or he cultivates. Furthermore, and critically, the land allocated to sorghum cultivation does not expand proportionally with the total land a farmer has for cultivation (the correlation coefficient being 0.18). If land expands, more of other crops are cultivated, while the cultivation of sorghum remains more or less constant.

In contrast to sorghum, millet is grown by only 32% of the households. They allocate an average of 0.6 acres to growing it.

Household type, so the study discovered, is not a determining factor in the allocation of land to sorghum and millet cultivation, or in the use of improved sorghum and millet seeds. But more female-headed households (62% of the households) sell sorghum than do any of the other household types. 33% of the female-operated households and 42% of the male-headed households sell sorghum, respectively.

Development workers commonly attribute the limited acceptance of sorghum and millet to a combination of causes. A popular set of arguments blames the targeted population: local farmers are said to be backward and conservative and lacking sound economic judgement by gambling on the cultivation of maize (which brings more money if it succeeds, but frequently fails due to droughts). It is further suggested that farmers do not grow sorghum and millet because they have developed a taste for maize and dislike sorghum.

These explanations are questionable. The local people are not “backward farmers” and, as will be seen in the next section, not even “subsistence farmers”. All the households in the survey have a complex household economy. Furthermore, 78% of the respondents went to school, 65% reached primary school level and 12% had adult education.

The “taste” argument is equally weak. It was found that a staggering 99% of all households consume sorghum regularly as a morning *uji* (porridge), while 88% eat it as *ugali*, which is also eaten in the morning or up until lunchtime. In 32% of the households, sorghum *uji* had been eaten on the very morning of the interview day; in 70% of the households it had been eaten in the previous week. A negligible 0.7% (2 households) do not eat sorghum *uji* at all. Although households harvest small amounts of sorghum from the little land they allocated to its cultivation, the survey revealed a tendency to sell sorghum – with 42% of the households doing so – mostly in the local market.

Another assumption about SMIP’s performance is that the scientists are to be blamed for the disappointing results. They have worked in their ivory towers, it is argued, as a result of which they have been out of touch with the local farmers, and have not selected cultivar properties which respond to the farmers’ needs and preferences. It does not appear from this study that the “aloof scientist” argument bears heavily on the sorghum problem. The Katumani Research Institute is situated in the local area and some of its scientists live there. Hybrids were developed and tested in local farmer’s fields at various sites in Machakos and Kitui. Research into farming- systems was conducted by social scientists involved in the programme. The breeders even took notice of the local people’s complaints about taste, dropping varieties that the local people said had a bitter flavour.

Another set of arguments points the finger of blame at the extension workers, whose responsibility is to disseminate new technology. The extension service is a government organ whose function is to extend services, technical advice and information to farmers in the rural areas. Normally, extension agents are graduates of a two-year course in agriculture, which entitles them to a certificate in agriculture. Their role is to go out and reach farmers in their farms, in *baraza*, or through agricultural demonstrations, wherever they can. The ongoing “story” is that extension agents do not reach the rural farmers in the remote and under-developed semi-arid areas and that they are blind to the gender dimensions, thus neglecting farming women. This was found to be untrue. People do grow and use improved varieties in conformity with the programme’s objective: 63% of the interviewees obtained Katumani varieties from either the extension service or the district administration.

Moreover, no statistically relevant differences were found between male-headed, female-headed and female-operated households in this respect, which counteracts the gender-insensitive critique. Also, there is a reasonable degree of contact between extension agents and farmers. A surprising majority (92%) of the farmers interviewed knew their local extension agent, with 68% of the respondents having had contact with the local extension agent in the year prior to the survey, and 38% having attended on-farm demonstrations. The extension agents do not, however, address the issue of sorghum, but generally discuss such issues as soil conservation and planting techniques. Only a negligible 0.4% of the farmers had discussed sorghum issues with the agents. This suggests an urgent need for promoting the awareness of the importance of growing sorghum and millet among the extension agents.

Although no statistically significant difference was found between different household types in their contacts with extension agents, female respondents appear to be visited less on their farms (25% against 40% of the male respondents) and attend fewer on-farm demonstrations than male respondents. In general, women talk as much with extension agents as men do, but they generally do so in public forums like the *baraza* communal meetings and, to a lesser extent, at demonstration farms. This suggests that the situation is not as bad as feared, although there is still a need to further improve gender equality.

The use of the technological package recommended by SMIP was also tested, on the hypothesis that farmers would not use it because they could not afford to pay for the input. It has been suggested that a vicious financial circle excludes farmers from the development process. To benefit from the improved sorghum and millet seeds, it is maintained, a farmer has to purchase certified seeds, fertiliser and pesticide, for which she or he has no money. The hypothesis reflects a general disillusionment with programmes such as SMIP, but the findings suggest that the situation is not so grim. The recommended technological package is used moderately: 35% of the farmers use certified seeds; 68% use ox-ploughing to prepare the land; 50% use row-planting and 39% use fertilisers.

Statistically significant differences between household types in the use of the recommended technological package are limited to the use of ox ploughs and the purchase of agricultural input. Fewer female-headed households (45% of the total female-headed households) use ox-ploughing than other households (82% for female-operated and 64% for male-headed households, respectively), in favour of traditional tools such as hoe, panga, and jembe.

22 As to the purchase of agricultural input, female-headed households come in last

and female-operated households first, with 11% and 40% of the purchased input, respectively.

It appears that the programme was amazingly successful in disseminating the improved sorghum seeds and moderately successful in disseminating the use of the accompanying recommended agricultural practices. These findings only heighten the puzzle: why do most farmers grow sorghum nowadays, but to such a limited and fixed extent?

### II.3 Cultural perceptions and assumptions

In recent years, there is increasing sensitivity to the fact that modernisation often involves an encounter of Western with indigenous knowledge and technologies, rather than transfers of these elements from the “haves” to the “have-nots”. The issue is one of cultural differences. While “modern” technology (seeds, methods, etc.) aims at standardisation, indigenous farming knowledge promotes flexible responses to fluctuating signals from the environment. The participant-observation research revealed that local farmers have developed a system of “grassroot indicators” to predict the start of drought and rain, to assess soil fertility and deterioration and to monitor seasonal patterns and changes. These indicators derive from people’s knowledge and observation of animal, insect and plant behaviour. They are used not only to schedule farming activities, but also to take preventive actions against predicted drought, such as planting drought-resistant crops, moving cattle to empty government lands (*syengo*) or the fertile lands of relatives, and increasing income-generating activities. Gender appears not to be a determinant factor in the depth of a farmer’s indigenous farming knowledge, but rather age and the farmer’s accumulated knowledge in the locality. Younger people, part-time farmers and immigrant farmers know far less than male or female “old-timers”.

The study’s diagnosis directs attention to differences between the deep cultural assumptions of “development recipients” and “donors”. SMIP’s planning and evaluation have grossly neglected the cultural context. Culturally, Machakos is a difficult host for the Programme. Akamba traditionally valued livestock and trade, as well as hunting and bee keeping. Agriculture was the least important for them. Nowadays, it was found, they are intent on diversifying the household economy, and are especially interested in market and trade activities.

Virtually all (but 1%) of the Akamba households included in this survey neither use sorghum for beer making, nor drink sorghum beer. Akamba make and drink sugar cane and honey beers rather than sorghum beer. They appear to regard sorghum as a nutritious breakfast food, which is believed

to accelerate growth and is therefore considered to be a food particularly suitable for young children. It is a limited purpose food, which Akamba people, unlike other ethnic groups in Kenya, do not use in other meals or on ceremonial occasions or traditional meals for special guests. The study suggests that this is an important factor in solving the puzzle: rather than being the alleged traditional staple food, sorghum was grown as a kitchen crop simply to provide breakfast for household members – especially children – and to sell small amounts in the local market. The improved technology could not affect the extent to which sorghum was grown for the household's own use, which was limited by the household size and the cultural meanings ascribed to sorghum.

Millet, on the other hand, has no cultural distinctions. It is seen as a basic ingredient for main meals. As such, millet lost its standing in the food status hierarchy to the modern alternative of maize. Maize, which enjoyed colonial support and appreciation, became a valued status food associated with modernising, educated classes. Millet, controversially, became a food associated with backwardness. The study suggests that, while the cultural niche which sorghum enjoys ensures its continued, albeit limited cultivation, millet has fallen into disuse and is grown much less, despite the programme's efforts.

An implicit unconscious assumption underlying the SMIP strategy was that the recipients are “subsistence farmers”. Deep down, the formative images were that their prime objective is to assure food security and grow crops that will provide sufficient food for the needs of their members. Furthermore, probably without the advisors being fully conscious of it, they also believed that the farmers were ignorant of better technology and needed only to be taught what to do by verbal advice or, better still, by demonstration farms. Sorghum consumption could be improved, it was thought, by developing new sorghum dishes for the farmers, who cannot develop them for themselves and mainly for this reason (so it was unconsciously presumed) they no longer ate sorghum. In this reasoning, whatever knowledge and cultural practices the farmers brought into the encounter with the development apparatus was overlooked.

The assumption that Machakos people are subsistence farmers is refuted by this study. The participant-observant study, the community profiles, and the survey work all showed in various ways that these people are market-oriented and combine subsistence with market occupations. Traditionally, going back to the 19th century, Akamba people had engaged in trade. Nowadays, there is hardly any activity that does not involve the use of money. Money is used in the most traditional realms of life, such as traditional



medicine, clan organisation and life-cycle rituals (birth, marriage, and burial). People need money for all the modern services as well, which are available in the local centres, ranging from school to medical services. In nearly 40% of the households, at least one member is formally employed. In over half of the households (52%), at least one member is involved in small-scale business, while 85% of the households sell farm produce in the local market. More than two thirds (72%) of the households have out-farm members working in urban areas, while 44% of the households have a member working in a large city. In most cases (61% of the households), members working away send money back home. Households of all types engage in moneymaking activities. It is not surprising, therefore, that people are prepared to, and do, purchase farm input and that they are not the “backward” farmers they are sometimes supposed to be. The study suggests that the market orientation of Machakos people is another critical factor in explaining the sorghum puzzle. SMIP has so far tried to encourage the cultivation of millet and sorghum as subsistence crops. Home economists working in the programme have tried to develop new domestic uses for these crops. The market for sorghum and millet has remained weak, with low prices, an inadequate transport system, etc. Developing a market and new industrial uses for sorghum and millet seem to be critical for the take-off in sorghum cultivation beyond the limited amount of sorghum needed for breakfast consumption.

With regard to the place of sorghum in the traditional economy and the economic rationality of local farmers, there are obvious gaps between the cultural assumptions of the “donors” and the Akamba (“recipients”) cultural situation. It is suggested that misinformed stereotype representations of “Third World rural farmers” have misdirected SMIP’s strategies. If sorghum is not a staple food for Machakos farmers and their objective is not self-subsistence, the only way to increase sorghum cultivation is by promoting sorghum for sale. Had the programme not promoted “food security”, but “market security” – i.e. a secure market for sorghum – the Machakos households would probably have grown much more sorghum. A local market for sorghum as a cash crop, or even export channels to other parts of Kenya and beyond, could have been developed, encouraging Machakos farmers to grow more sorghum. In other parts of Kenya, where sorghum is eaten at home to a far greater degree than in Machakos, the programme’s strategy, i.e. the promotion of improved sorghum as secure subsistence food may have had greater success.

The choice of Machakos as a host for the Programme, given its drought-prone areas and its population which frequently requires food

relief, was ecologically sound. But from a cultural point of view, Machakos was the wrong choice. The many scientists involved in the programme's work – agronomists, weed scientists, soil and water scientists, breeders, food scientists, extensionists and social economists – should have been, or at least should be by now, sensitised to culture. The practical conclusions presented in the next chapter are based on integrating cultural insights into economic and social data as a basis for planning.

#### II.4 Conclusions

The study shows that we must be careful about making sweeping generalisations about gender, labour and the household economy in rural Africa, all of which are constantly changing and modernising. Contrary to the hypothesis tested, the study demonstrated that, in the rural reality of Machakos in the mid-1990s, no strict gender division of labour by task existed. Women and men largely shared household production tasks, including cultivation work, although women mostly do the domestic chores. Cash income is considered essential and the household diversifies its activities to include formal employment, self-employment and the sale of produce. Out-migration for work in town is an important source of income for the rural household. Overall, husbands do send money back home and female-operated households are therefore stronger than other households.

SMIP, which aims to increase the cultivation of the indigenous traditional food crops sorghum and millet, succeeded in the steps it took, but these did not lead to the desired effect. It was found that the improved seeds were successfully distributed and farmers even adopted the recommended technological package to a moderate degree. However, while most farmers grow sorghum, they all grow very little of it. The study revealed that sorghum is considered to be a breakfast food, which is especially good for children, and millet suffers from low status, being associated with lack of upward mobility in the eyes of the Akamba community. These cultural associations constitute a limiting factor in the quantities of sorghum and millet grown, irrespective of how much technology improved their production conditions and results. Furthermore, SMIP's promotion is built on the wrong assumption that the local farmers are subsistence farmers, while in fact they are so deeply involved in the cash economy that marketability, rather than food security, or even better yields, can stimulate an increased production of sorghum and millet.

Beyond the indispensable need to see women as part of the rural community and to appreciate their diverse familial situations – rather than leaving them invisible, as was the tendency in earlier years – no serious

gender-related factors limiting the success of SMIP were found. At the same time, the practical solution which the study points out, namely, improving the marketability of sorghum and millet, can help women, in particular. Very few women engage in formal employment and they can hardly leave their families and migrate to towns in search of work. Promoting cash crops that can be grown in this area, despite its harsh environment, can help such women to earn the money they need for the functioning of the household in the new rural reality of the 1990s.



## III. Discussion

### III.1 Scientific relevance

#### *III.1.1 Women in culture*

Theoretically, this study cautions against over-generalisations of “the rural woman”, revealing for Machakos in the mid-1990s a very different reality from the stereotype static “rural Africa”. It suggests that differences observed between the (perhaps equally stereotype) Western “male farmer” and the African situation should not be conceptualised by a simple opposite, the African “female farmer”. The study also warns against universal “differences within gender” distinctions, such as those among women in different family situations. The study shows that such distinctions do not simply cut across cultures. Within the patrilineal system that permeates Akamba society, male-headed households, female-headed households, and female-operated households create different realities for women, but in a different way from the Western context. The patrilineal culture – which should not be confused with the patriarchal culture that many feminists speak about – generates a common field of constraints and possibilities, within which the constraints and the possibilities of each household type stand out. Women devise strategies within their household to make the best of what they can, accruing power and position. In Machakos in the mid-1990s, female-operated households are economically strong, and the most “developed” by Western criteria of “development (e.g. education level, consumption of Western goods, limited household size). Female-headed households live materially in the most traditional style, but the women enjoy a higher degree of autonomy and control, and devise strategies to build up a good production base of land and livestock. Neither they, nor the female-operated households, consist of women and children only. Other relatives, who live in the extended households and, in the case of female-operated households, male employees considerably help them.

### *III.1.2 Culture in development*

This work stresses the importance of paying attention to cultural differences between “development donors” and “development recipients”, both of whom – in Clifford Geertz’ famous words – are “caught in webs of meanings” (Geertz, 1973). Everyone is so caught, including personnel in the development apparatus.

The emphasis on cultural differences can be seen as an emerging development approach, to be added – as the most recent member – to the earlier ones, including the 1970s emphasis on scale-neutral technology, the 1980s sensitivity to women and the 1990s recognition of indigenous farming knowledge and sustainable development. The importance of this emergent approach can be seen sharply in the case of SMIP, since in this case the earlier approaches were not sufficient in themselves.

This approach builds on the tradition of development anthropology, which has emphasised since the 1970s that, in order to understand people’s actions, resistance and preferences, it is necessary to gain a sense of how actors themselves perceive and order the world. Going further, it integrates awareness and sensitivities promoted by the new critical anthropological studies of the development institution and the development culture themselves. This approach advocates a study of cultural differences, modelled on the study of differences in gender studies. It maintains that cultural differences are a critical part of a reality shared by people from different cultures. A culture cannot be studied in isolation from others, but within its relationship with other cultures. The Machakos case sharply illustrates the need for such an approach. A Machakos village is a local globe: its economy and society stretch far beyond its local geographical limits, encompassing agents and forces of the world as a “global village”.

Cultural differences are not static, nor necessarily a distancing and disruptive force. They can provide a necessary tension for a creative dialogue, which constantly produces middle grounds, new differences within them, newer middle grounds, newer differences, etc., etc. Essential to this approach is a methodology that encourages and builds on a cross-cultural team and a dialectical research process.

### **III.2 Recommendations for further research**

It is recommended that more attention should be paid to the cultural assumptions of the programme’s scientists and extension agents. Each of these groups has its own cultural assumptions about the sociological reality of the area which the development programme aims to help. The assumptions are partly explicit and partly implicit, and they concern such diverse issues

as the household structure, gender relationships, and the local economic orientation (subsistence or market economy, etc.). These assumptions affect the decisions made and the course of actions taken by the development agents. To the extent that these assumptions reflect a sort of Africanism on the part of the development agents, they can get in the way of the programme's performance and success. It is therefore suggested that it is important to study the development donors as well as the development recipients culturally, socially and economically.

In view of the importance of drought-resistant crops such as sorghum and millet for food security in large areas of East Africa, it is recommended that the horizons should be broadened and that the place of sorghum and millet in the economy and culture of other Kenyan communities besides Akamba should be examined cross-culturally. It is suggested that the kind of research undertaken in this study should be extended to the Ameru, Abagusii, Iteso and Abalyuia. Traditionally, these communities relied on millet as their staple diet. In addition, the Iteso still brew their beer from millet. A comparative study in each case between sorghum and millet is recommended, allowing for the possibility that they are differently situated in the local cultural economy, and that different development programmes may be needed for increasing their cultivation.

As far as the field of "Gender and Development" studies is concerned, research on contemporary manifestations of traditional patrilineal principles of ordering and perceiving social life is considered vital. Patrilineal social systems have been common among African communities and they do not simply go away, but keep changing and modernising in manifold ways, in both rural and urban situations. The position of women and the scope for its change is greatly affected by the patrilineal outlook and structure. This is not sufficiently appreciated in the literature, which tries to understand women's lives according to parameters derived from the Western discourse of class, family situation, etc. The inner logic of African gender relations and family life, it is hypothesised, is often rooted in a patrilineal organisation and structure of social life.

With regard to Third World "rural farmers", there is a need to study how households diversify their economic activities, with particular reference to the combination of farming with small business. In late 20<sup>th</sup>-century Machakos, combining farming with other income-generating activities is the objective of all households, and is already the practice of nearly half of the population. The emerging rural reality is interesting theoretically, and has practical implications for development planning.

### **III.3 Practical applicability**

The research has direct relevance to the economic problems of the drought-prone, arid and semi-arid lands of Eastern Kenya, in that it points to ways in which SMIP, that has tried to address these problems, can improve its performance. It is maintained that the programme did not succeed in reintroducing sorghum as a major staple food in the area, because it stressed its use as a secure subsistence food. As Akamba people living in the Machakos are market-oriented and their social life requires the use of money, the general direction towards a solution is thought to lie in promoting sorghum as a cash crop, in order to motivate them to grow it. Practical follow-up suggestions are presented in the next chapter.



## IV. Recommendations

The recommendations for practical follow-up that arise from the study fall into three groups, concerning, respectively, what can be done within the Programme and the extension service (IV.1-2), within Machakos (IV.3) and at the state level (IV.4-7).

### IV.1 Treat sorghum and millet separately

In the first place, it is recommended that sorghum and millet should be treated separately. Farmers and, possibly, consumers, too, perceive these crops differently. Their cultivation patterns are markedly different: 89% of the households cultivate sorghum and 32% cultivate millet. Their market prices are also different, ranging between Ksh 190-900 (US\$ 3-15) per bag (90 kg) for sorghum and Ksh 600-1500 (US\$ 10-25) per bag for millet. Addressing these crops together may result in overlooking the unique problems of each, while the strategy adopted for both together may not be the best for each on its own. Artificially clustering these different crops under one heading often generates a neglect of one in favour of the other.

KARI maintains that it not only treats the two crops separately, but also recognises the special problems posed by each crop. However, the effect of the SMIP on the farmers and support institutions appears to be that these crops are somehow interlinked. The Machakos Kamba, however, have a marked preference for cultivating sorghum rather than millet.

### IV.2 The extension service should emphasise sorghum and millet production

The study demonstrated that most farmers are not only aware of the existence of agricultural extension agents in their midst, but also that 60% have talked with them about farming during the previous year. Most people have a good opinion of the effectiveness of extension agents. While the performance on these scores is not as dismal as the “story” implies, the one thing that is important for the programme is not being done, however. With the exception of one household, the extension agents did not talk about sorghum matters, while millet production was discussed with none of the households. Extension agents talked about a host of other farming issues, the most common being

soil conservation – undoubtedly an important issue in these arid and semi-arid lands – and planting methods. Since only 32% of the farmers sampled actually grew any type of millet, the results suggests that both the farmers and the extension service place little importance on these crops and do not wish to spend valuable time on them. Interestingly, 63% of the farmers obtained Katumani varieties from either the extension service or the district administration.

An important factor that should be taken into account is that the results of this study on sorghum and millet production in Machakos are probably overestimated. The field study was conducted in 1995, which directly followed a drought year. Had it been a “normal” year, there would most likely have been less of these crops grown. If the researchers had been to the field a year earlier or a year later, they presumably would have obtained very different results about the cultivation of these dry-land crops.

This complex picture leads us to suggest that the extension service should formulate a definite policy supporting the production of these crops. The extension agents themselves should be convinced of the local and national importance of growing sorghum as a dry-land crop, once a market is created. They should then encourage farmers more explicitly to grow these crops and this, if backed up by increased demand coupled with improved prices, could result in expanded production.

#### IV.3 School breakfast programmes

The most common use of sorghum in the Machakos District is the making of *uji* or porridge, the most important breakfast item. In Machakos District, out of a projected population of one million in 1999, approximately 561,000 are under the age of 19. The majority of these (approximately 300,000) are in the formal school system, while a further 50,000 are in various training institutions. School feeding programmes are already in progress in the arid and semi-arid lands under the World Food Program, including the driest parts of Machakos. These do use traditional food crops to some extent and the use of sorghum and millet varieties could be further emphasised. Boarding schools and institutions should also be encouraged to use sorghum and millet *uji* or breakfast, as well as other dishes for main meals. Attention should also be drawn to these crops in school agriculture courses, where their cultivation and advantages could be taught to the next generation of farmers and consumers.

#### IV.4 Incorporate sorghum and millet into the strategic reserve programme

34 Given the country's current food situation and the fact that arid and semi-arid

lands are the worst hit, so that they require almost continual food relief, a strong argument can be made for partially substituting sorghum and millet grain for maize in the strategic food reserve programme. Thus, a steady market for these crops can be ensured for these crops, the biggest hindrance to the cultivation of which appears to be the lack of a market. It is generally acknowledged that the food reserve programme has suffered setbacks in the past, as in several cases reserve maize has mysteriously been exported, creating problems when famine threatens. Because Kenya faces many constraints on agricultural production, especially through the shortage of good quality land, it seems clear that food production can only be expanded in the arid and semi-arid lands, where only drought-resistant crops can do reasonably well under rain-fed conditions (KARI/MIAC, 1997).

The decline in agricultural production over the last two decades is particularly worrying, given that Kenya depends on agriculture to provide food security, absorb labour and boost export earnings. Kenya has one of the highest population growth rates in the world, so the seriousness of the situation cannot be overemphasised. This year, for instance, Kenya will have to import an estimated seven million bags of maize and three million bags of beans to make up the national shortfall. This is in a country which, until 15 years ago, was more or less self-sufficient in food. If even a part of this could be replaced by locally grown products, the country would not only save a great deal of foreign exchange, but also benefit farmers and, therefore, local economies in the arid and semi-arid lands, by creating a demand for dry-land products. If these farmers had more income, they would be able to improve their standard of living and that of their communities while, at the same time, assuring food security within and outside their localities. Although maize is the preferred food in Kenya, it is not clear why those on famine relief must receive only maize grain; presumably, since they are not in a position to choose, they would be glad of food relief in any form.

If a programme could be set in place under which all sorghum and millet offered for sale were bought at a guaranteed price that was fair to the farmer, and the grain purchased used for strategic reserves, thereby partially replacing maize, benefits would accrue in several ways. Firstly, the farmers in the arid and semi-arid lands would be motivated to produce the grains best suited to that terrain and so put more resources into their production, thus expanding it. Secondly, the farmers would reap economic benefits from these crops thereby improving their economic situation and that of their communities. Food security would improve, owing to the expanded production of grain, coupled with the fact that it is unlikely that these crops offer the same temptations as those inherent in maize. Finally, the country

would save on precious foreign exchange now used to import food to make up the national shortfall. This money could then be put to productive uses rather than to famine relief.

#### **IV.5 Change the legal framework**

Currently, Kenyan law does not allow the use of grains other than wheat in commercial baking. These laws date back to the 1940s, when colonial settler farmers sought protection over a wide range of issues (Heyer, Maitha and Senga, 1976). Wheat producers sought to protect their interests by preventing the use of any other cereals in commercial baking. These laws are still in force, although the situation has changed greatly since then. For example, Kenya is no longer self-sufficient in wheat production and imports about half of its requirements. It therefore no longer makes sense to protect local wheat, but it would make sense to promote other local crops like sorghum and millet, not only on economic grounds, but also on the grounds of food security in the arid and semi-arid lands. The necessity of changing these laws has been addressed in several forums by KARI, but draft laws have not as yet been tabled in parliament. In fact, lawmakers have yet to be appraised of this problem in any meaningful way.

A bakery in Baringo District named Makatiat Bakery has experimented with composite flours that include sorghum and market tests proved very successful. Sample breads and other bakery products were well received by sample consumers, which further stresses the case for a change in the laws. On other fronts, sorghum beer has been in commercial production for years, but SMIP officials consider that it should first be vastly improved in quality before production is expanded. Sorghum “rice” has been in production for some years as well, but is not yet a well-known product and promotion could greatly increase its sale.

If commercial bakers are allowed to use composite flours, it is possible that the demand for sorghum and millets would rise, thus stimulating an increase in price that would motivate farmers to expand their production.

#### **IV.6 Promote sorghum and millet in other parts of Kenya**

The solutions suggested above could be applied in other parts of Kenya where these crops are already cultivated, as well as in those parts where they are not widely cultivated, but should be. In Western and Nyanza Provinces, these crops have a positive image, are widely grown, and well liked. However, they tend to be restricted to those areas, instead of entering the national economy. If the solutions suggested here were applied, these provinces would benefit in much the same ways as described above. In those

parts of Kenya which are as arid or even more arid than Machakos, such as the North-Eastern Province, the promotion of these crops could be of more crucial benefit than in Western and Nyanza provinces. In fact, this province is more susceptible to drought and famine than Machakos and the effects are more pronounced. Alleviation of hunger and food stress in such areas remains an urgent task.

#### **IV.7 Glamorisation of millet**

Although the study did not focus directly on this issue, it became apparent that sorghum suffers “image” problems compared with maize, which enjoys a “modern”, “Western” glamour. Media and education programmes portraying sorghum and millet in a positive way, perhaps connecting them with national pride, could help to increase consumption nationally and hence the demand for sorghum.

The key to increasing sorghum production in Machakos, as seen here, lies not only in disseminating the technology and trying to teach farmers its importance and value, but also in changing the market conditions, so that farmers themselves will choose to produce more sorghum. The Kenya Agricultural Research Institute (KARI) has started to work for changing the laws in a way that will increase the demand for sorghum. This kind of work should be encouraged and taken much further. Beyond the national market, there is a large international market for sorghum, which Kenya can strive to enter.



## References

- Ahmed, I. (ed.) (1985). *Technology and rural women: conceptual and empirical issues*. London: Allen and Unwin.
- Boserup, E. (1970). *Women's role in economic development*. London: Allen and Unwin.
- Buruchara, R. (1987). 'Agriculture and livestock' in S.G. Were and J. Akong'a (eds.) *Machakos District: socio-cultural profile*. Nairobi: Government of Kenya.
- Central Bureau of Statistics (1989). *Kenyan population census*. Nairobi: Government Printer.
- Feldstein, H., Poats, S., Cloud, K. and Huisinga, N. (1989). *Working together: gender and analysis in agriculture*. West Hartford, Conn.: Kumarian Press.
- Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.
- Gilligan, C. (1982). *In a different voice*. Cambridge, Mass.: Harvard University Press.
- Heyer, J.U., Maitha, J.K. and Senga, W.M. (1976). *Agricultural development in Kenya: an economic assessment*. Oxford: University Press.
- Kalule, H. (1987). 'Family life' in S.G. Were and J. Akong'a (eds.) *Machakos District: socio-cultural profile*. Nairobi: Government of Kenya.
- Kamau, C.K. and O'Neil, M.O. (1990). *Sorghum improvement in Kenya*. EARSAM seventh Regional Workshop on Sorghum and Millet Improvement. OAU/SAFGRAD/ICRISAT.
- KARI/MIAC (1997). *Sorghum and Millet Research Program: production and utilization guidelines*. Nairobi: KARI/INTERSOMIL/USAID-MIAC.
- Kitching, G. (1980). *Class and economic change in Kenya - the making of an African petite bourgeoisie, 1905-70*. New Haven, Conn.: Yale University Press.
- Lambert, H.E. (1947). 'Land tenure among the Akamba', *African Studies* 6(3):131-47.
- Lindblom, G. (1916). *The Akamba in British East Africa*. Uppsala: Inaug. Diss.
- Mbiti, J.S. (1966). *Akamba stories*. Oxford: Oxford University Press.

- Middleton, J. (1953). 'The central tribes of the North Eastern Bantu' in D. Forde (ed.) *Ethnographic survey of Africa: East Central Africa Part V*. London: International African Institute.
- Mohanty, C. (1988). 'Under Western eyes: feminist scholarship and colonial discourses' in *Feminist Review* 30:61-88; also in C. Mohanty, A. Russo and L. Torres (eds.) *Third World women and the politics of feminism*. Bloomington: Indiana University Press.
- M'Ragwa, L.R. and Kanyenji, B.N. (1987). 'Strategies for the improvement of sorghum and millet in semi-arid Kenya' in J.M. Mayonga, T. Bezuneh and A. Youdeowei (eds.) *Food grain production in semi-arid Africa*. OAU/STRC-SAFGRAD International Drought Symposium. 19-23 May 1986, Nairobi.
- Munro, J.F. (1953). *Colonial rule and the Kamba*. Oxford: Clarendon Press.
- Ndeti, K. (1972). *Elements of Akamba life*. Nairobi: East African Publishing House.
- Osaga, O. (1987). 'Hunting and gathering' in S.G. Were and J. Akong'a (eds.) *Machakos District: socio-cultural profile*. Nairobi: Government of Kenya.
- Overholt, C.A., Anderson, K., Cloud, K. and Austi, J.E. (1985). *Gender roles in development projects*. West Harford, Conn.: Kumarian Press.
- Parpart, L.J. (1995). 'Post-modernism, gender and development' in J. Crush (ed.) *Power of development*. London: Routledge.
- Paterson, D. (1980). 'Coping with land scarcity: the pattern of household adaptation in one Luhya community', WP 360, University of Nairobi, Institute for Development Studies.
- Rao, A., Anderson, M.B. and Overholt, C.A. (1991). *Gender analysis in development planning: a case book*. West Hartford, Conn.: Kumarian Press.
- Sen, G. and Grown, C. (1987). *Development, crises and alternative visions: Third World women's perspectives*. New York: Monthly Review Press.
- Spelman, M. (1990). *Inessential Women*. London: Women's Press.
- Ventura Dias, V. (1985). 'Modernisation, production organisation and rural women in Kenya' in I. Ahmed (ed.) *Technology and rural women: conceptual and empirical issues*. London: Allen and Unwin.
- Whitehead, A. (1985). 'Effects of technological change on rural women: a review of analysis and concepts' in I. Ahmed (ed.) *Technology and rural women: conceptual and empirical issues*. London: Allen and Unwin.



# Appendix I

## Participating researchers and institutions

### 1. Researchers:

(Mrs.) Dr. Nurit Bird-David, Project Coordinator  
The Institute for Social Research  
Tel Aviv University  
Ramat Aviv  
P.O. Box 39040  
Tel Aviv 69978, Israel  
n.bird@soc.haifa.ac.il

(The late) Mrs. Wilhelmina Oduol (Cooperating Researcher) (\*)  
Institute of African Studies  
University of Nairobi, Kenya

Mrs. Winnie N. Karugu (Cooperating Researcher)  
Jomo Kenyatta University  
College of Agriculture & Technology  
P.O. Box 62000  
Nairobi, Kenya  
Phone: 254-151-22646/7/8/9 ext. 25; fax: 254-2-722969

Prof. Simiyu Wandibba (Senior Advisor)  
Institute of African Studies  
University of Nairobi  
P.O. Box 30197  
Nairobi, Kenya  
Phone: 254-2-742078/742080; fax: 254-2-780510/222036

**2. Research assistants:**

**Mrs. Rhoda Mutua  
Mr. Francis Mwanzia**

**3. Interviewers / enumerators:**

**Miss Ruth Koki Muunda  
Miss Margaret Mbithe  
Miss Rosemary Kilonzo  
Mr. Caxton Isavi  
Mr. Sylvester Maithya  
Mr. Peter Mwasya**

**(\*) deceased**

## Appendix II

### **Follow-up of the project: capacity building and project-related publications**

As a result of the project, the Institute of African Studies, University of Nairobi, has established a long-term networking relationship with the Department of Sociology and Social Anthropology of the University of Haifa. Plans are now underway to develop a joint proposal for research on some issues arising from the current project. Before the present project, this institute did not have any formal contacts with any institution of higher education in Israel.

The project has provided a framework within which the co-operating Kenyan researchers were able to acquire experience and expertise in interdisciplinary research, combining qualitative and quantitative methods. The late Mrs. Oduol – who participated in the project from the beginning, but died before it was completed – was going to pursue her PhD studies within the context of the project. Mrs. Karugu is applying the research methods and experience acquired within the project in her PhD research on a related topic which is now in progress.

The joint writing of a planned book will provide an additional training framework for the Kenyan researcher, enabling her to experience the research process from conception to academic publication which, needless to say, will contribute greatly to her academic career.

#### **Publications:**

Oduol, W. (1996) 'Akamba land management systems: the role of grassroots indicators in drought-prone cultures' in H. Hambly and T. Onweng Angura (eds.) *Grassroots indicators for Desertification: Experience and Perspectives from Eastern and Southern Africa*. IDRC, Ottawa.









