Gender, Biodiversity and Local Knowledge Systems to Strengthen Agricultural and Rural Development: The Tanzanian Context

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Preface

This report consists of three papers developed for the LinKS project and presented at the First National Workshop to the LinKS project (GCP/RAF/338/NOR), which took place at the Tanesco Training Centre in Morogoro, 22-23 June 1999. The LinKS project is an outcome of the FAO regional efforts to develop mechanisms for implementation of gender sensitive policies, programmes and participatory technology development for the in-situ conservation, sustainable use and management of agrobiodiversity for food security. The mechanisms are directed to build on the local knowledge and skills of both men and women food providers.

The first paper is a modified version of the Keynote Address presented by Professor Adolfo Mascarenhas, who also is the editor of this report. The second paper by Dr Bertha Koda provides an overview of the research in Tanzania on gender, biodiversity and local knowledge in Tanzania, providing recommendations for follow-up. Ms. Theonestina Kaiza Boshe presents a discussion of relevant legal and policy issues as well as an overview of the institutional framework to the project in Tanzania. Together, the papers provide a broad background to the project in Tanzania; constraints, challenges, and the way ahead.

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PROSPECTS FOR CREATING AN ENABLING ENVIRONMENT FOR LOCAL KNOWLEDGE SYSTEMS TO FLOURISH IN TANZANIA

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“He who would do good to another must do so in Minute Particulars;
General Good is the plea of the scoundrel, hypocrite and flatterer;
For Art and Science cannot exist but in minutely organised Particulars”

William Blake (1757-1827) in Jerusalem

1 INTRODUCTION

As a result of globalization the forces marshaled to bring changes in Tanzania are formidable. In this situation there is at best a great deal of ambivalence, because the forces are both: rational and contradictory, subtle and gross, liberal and also tyrannical. There is need for major adjustments and while these conventionally have focused mainly on economic reforms the adjustments are necessary in every aspect of life. Reforms have differentially affected nearly all segments of the society. Therefore irrespective of whether the changes are imposed or voluntarily entered into, the people and the government of Tanzania have to face major dilemmas. As will soon become apparent, nowhere is this situation more critical than in the agricultural sector. Narrow perceptions about the role of the traditional sectors in the rural areas have to be broadened to conform to the realities of rural people. For instance, in Kondoa or the Ulugurus, agriculture is not only about land and crops, it is about food, climate, labour, management of natural resources, extraction of medicines, ancestors, knowledge – it is about a way of life.

Most of the countless people in the country to whom agriculture gives livelihood, have no other plans but to go on with the existing pattern of development. This means accepting the known continuity on the one hand and/or be driven to change on the other hand. The majority of the older people are inclined to favour the former. This means those peasants growing coffee, cashew or cotton or for that matter those growing bananas, rice or maize will continue to do the same, as perhaps did their parents before them. However, they can now make a few more choices: use local seeds or commercial varieties, chemical fertilizers or traditional means to maintain the fertility of soils etc. But at the same time peasants have also been asked to accept new responsibilities and conditions: they have to pay school fees; pay for health and even for the land on which they cultivate is “given” by the good grace of the government. Farmers can see prices for crops like cotton plummet and yet they may be coerced or tempted to grow them as export crops. Liberalizing the market did not mean improvement in prices and so some will abandon growing a specific annual crop and others with perennial tree crops can become frustrated enough to up root them. Superficially, while there may seem to be a great deal of continuity in the rural way of life; nevertheless there are periodic adjustments that have to be made and some of them could be traumatic - Maji Maji, villagization in parts, Aids. Contrary to some opinions, peasants in Africa have had to make adjustments for a very long time (Kimambo 1995). Other historians have documented the trauma of losing land, losing power etc (Maddox, Giblin, & Kimambo 1996). At the new crossroads, the

changes that rural people have to make concerning land, food, employment, health, gender relationships are significant and far-reaching. It is in this context that the LinKS programme is so important.

The expected changes are significant to the livelihood of people in the sense that major decisions will be taken in economics, in politics, science and technology and on gender relations. Tragically too, in this part of the world, even peace and development cannot be taken for granted and in parts of Tanzania are already threatened. All these changes have a major impact on agriculture, while not directly being part of agriculture. Therefore the prospects for creating an enabling environment for knowledge systems to flourish and for gender and biodiversity to be mainstreamed can only be understood in a wider context of development. It is stated that the objectives of the project will be served through three component programmes which will address matters concerned with Communications, Actions and Research, and Policy and Advocacy (FAO/TFNC Project Document).

Given the recent reforms and changes that have taken place or that are anticipated the objectives of the project will be better served by focusing on success and failures, paying attention to the influence of reforms including the impact of governance and democracy on development. This assumes that there is transparency and disclosure of information and a willingness to disseminate knowledge and information. Attention has to be paid both in a conventional and also in an innovative sense to the great discrepancies on information that exist between genders, on the role of biodiversity and above all on issues of food security.

For the LinKS project that has been launched in Tanzania, this means understanding, the laws, the policies, the environment and above all the people their culture. In the absence of consensus even for the main terms used, the agenda could be very large. For instance the interpretation of both the operative aspects of the project, gender and biodiversity, have been subjected to a considerable degree of discussion but despite this there is still misinterpretation. Gender for instance does not mean women only, it includes both men and women and because of the socio-economic situation, it seeks very much to identify the distinct contribution of each. Ungendered data does not tell one very much about who is doing what. It is devoid of the social processes at work. Similarly, the view that biodiversity is a topic to be left to taxonomists alone is also a very flawed one. Biodiversity is a subject of great social, political and scientific concern. Indeed the topic is open to a great deal of contradictions.

The term “food security” has a different meaning for different people. It is so loaded that it requires all types of qualifiers. For instance some bureaucrats interpret it mainly in a national context. This then could mean a strategic grain reserve, the investments and cost of operating these services etc. In such circumstances the role of outside experts, local or foreign, formal costs and estimates become predominant. In the context of LinKS programme and the sheer size and diversity of Tanzania, local knowledge has greater affinity to household or community level than at a national level. Some of the major challenges to the programme arise because of the apparent contradiction between local and national level. Since both the national and local level are important the situation requires attention and critical analysis. For instance some may claim that in areas in Tanzania where local knowledge systems are dominant in agriculture, such as in the Rufiji or in Masailand, there is a great deal of backwardness! This may be true in a narrow economic sense but within a wider context of the application of IKS, such areas have great potential scientific value, are important for the conservation of habitat and sustainable use of resources and altogether, there is a great deal that these communities can contribute. (See Box 1).

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2 For instance the influx of refugees from the neighbouring countries of the great lakes region has dramatically doubled or even trebled. the population of some districts in Kigoma and Kagera. Major environmental changes have taken place by the destruction of forests and pollution of water sources. Local agriculture has also suffered because of acts of banditry.
Box 1  Some Aspects of local knowledge systems in the Rufiji Delta

The Rufiji Delta is large, some 1,400 km²; and it contains the largest remaining mangrove forest on the Eastern Coast of Africa. Depending on the time of the year there are immense shifts of water volumes both from the terrestrial side and from the maritime tides. According to Gibbon, “the Rufiji Delta is stunning”. Sorensen goes on to add that “…it is complex and contradictory in its expression of the elements which make up the environment: it is calm and violent, extraordinarily productive and destructive, dangerous and soothing. The indigenous people have an intimate knowledge of this complex, mutable ecosystem and how to make use of it....”

The IKS of the people is comprehensive. It pertains to knowledge about tides and floods and the consequences of each and their impact on productivity. People have knowledge of soils and the habitats in which specific varieties of fish and other marine creatures breed. Some of the natural resources, such as mangrove poles, have been used both locally and for export to Yemen and the Persian Gulf area for centuries. The threat to the mangrove eco-system is not that they are being used by local people but on the terms of trade.

Rice is one of the major staple crops, the others are cassava, maize and sweet potatoes. More than a dozen varieties of rice are in existence. One variety has a maturity period of 3 months and it is ready for consumption by March so that it “cures famines”. Unfortunately, it is susceptible to bird attack and is difficult to store. The more common rice varieties, such as afaa (red), boko (white), machale (yellow) and supa, take up to six months to mature. Varieties are preserved because of their taste, aroma and yields. Some varieties are planted because the stems are taller and they can withstand the normal floods, others because they require less water.

In a recent survey it was found that there were at least nine varieties of wild vegetables that were widely consumed especially during periods of stress. The Kolombwani is a leafy vegetable found throughout the year and is found near salt water; both the Mwage and the Lende are weeds in paddy fields which are used to make relishes; the ngumbukumbu is a wild pea that is available during January to June; the matembele similar to the sweet potato but never produces tubers. It is cultivated near wetlands because it produces leafy vegetables throughout the year. In addition there were ten wild fruits that were consumed as fruit, snacks or had other uses. The mtonga has small red edible fruit but the plant can also be used as an abortant (Sorensen 1999). Oil for domestic use comes from the palm, coconut, groundnuts and sesame. The local communities recognize more than four different varieties of shrimps and prawns.

This brief description of the Rufiji delta shows the richness of the IKS. What comes out is that the local communities have nurtured and developed their natural resources to secure food, medicine, energy with an explicit sense of understanding of their ecosystem. They range from a deep appreciation of the micro-environments or habitats necessary for ensuring diversity and production, to an awareness of how biodiversity of the local rice varieties could be used to resolve specific problems of insect pests, addressing issues of “the hungry months” and which even harness the normal beneficial floods etc (Sandberg 1974).

1.1 Scope and organization

Given the complexities of the changing situation in the rural areas, some priorities have to be made. This first part of the contribution to the LinKS programme tries to give both context and background under which the programme will be implemented. Since Tanzania is not an isolated island, it is important to be aware of the debates, the controversies and the options that exist. Major changes may come not as a result of what happens in laboratories in Mikocheni but on the participation of the civil society on matters of governance, the practice and acceptance of democratic rights of men and women, respect for the rule of law, a sense of ownership and culture. (Veit, Mascarenhas, and Ampadu-Agyie, 1995). In a review of the situation in Africa these were found to be some of the critical variables.

Hybridization of seeds and biotechnology depend so much on biodiversity. Given the great attrition in agrobiodiversity, mainly brought about by commercialisation of seeds and other modifications made to them, there is a real danger that much will be lost. Without awareness of the past and a comprehensive approach, the current debates on for instance farmers’ rights to seeds and the options that exist for action will be futile. It is important to recognize the pit-falls and opportunities that exist. As elsewhere in the world, so well illustrated by the concerns, debates and publications of the the Dag Hammarskjold Foundation, the playing fields in Tanzania may not always be level for the LinKS programme. Some of
these issues are reflected in this paper, even if discontinuously. Basically, the paper focuses on some of the problems and another section explores the enabling environment for the programme.

The next section by Bertha Koda attempts to bring the conceptual linkages between gender, agro-biodiversity and indigenous knowledge systems within the Tanzanian context. This contribution is followed by the third part by Theonestina Kaiza-Boshe, who explores the prospects for gender-biodiversity links for rural development in the country in the context of the present policy framework in Tanzania. Out of necessity the following two chapters focus attention on Tanzania. Yet, there is also the need to have the international dimensions in law, information on the policies and practices of multinationals and multilateral organizations. These aspects needs special attention in Tanzania, and much work remains to be done in this area.

Given the dual nature of agriculture and development in Tanzania there is a danger that attention will be focused on the formal, export-orientated sector to the exclusion or to the disadvantage of largest sections of the more vulnerable communities. There is the risk that communities will be persuaded or even forced to adopt new varieties without attention being paid to the real needs of the communities themselves.

As has already been pointed out, the discrepancies between rhetoric and reality in the field concerning the main components are so great that the issues are worthy candidates for a keynote address. This in addition to recent history of agriculture in Tanzania that for over a century has been dominated by a dual system: one the one hand the diversity and neglect of the traditional systems, and on the other the preoccupation to promote or even force people to cultivate export crops. The former was outside the mainstream of research and was neglected both by the colonial and the independent government. It has been subjected to a great deal of change. In some areas, such as the Kilimanjaro, the two systems co-exist and could even be said to be fused. In a number of areas since they were not regarded as optimum for export crops, the traditional systems dominate. These should be the focus of activities. The agriculture we see today both quasi modern and the traditional ones, are based on hundreds of actions and decisions some taken many generations ago but which still have an impact on contemporary society. A historical approach to understand the situation in Tanzania would make us conscious of the need to have a wide perspective of the present situation. Can we learn from history? History may not repeat itself but we can learn a great deal from it, even if we examine the fragments. Let us relax and take an excursion in space and time.

1.2 History and convergence

Allow me to extend the present into the very recent past. In the late fifteenth century, two pincer movements, by the explorers, Christopher Columbus and Vasco da Gama made the world one. One can even say that this was round one or the start of globalization. Although these "discoveries" and other subsequent chain of events made the world one, they have not ceased to widen the disparities between groupings of people in the north and south. For Africa, these pincer movements had a colossal influence on the subsequent economy and agriculture of the continent. For instance maize and cassava, not native to the continent, have become staples in sub-Saharan Africa, from the Atlantic shores to the heartland of the Congo to the coast of the Indian Ocean; from its home in Brazil and central America, the cashew has become a leading export of India, Tanzania and Mozambique. These explorations had important consequences to Africa. But let us move on and see how seemingly disparate activities converge in history and bring massive changes.

In the seventeenth century in what is the Netherlands today, an unlearned genius, Anton van Leeuwenhock, fashioned the first microscope and in the following century the Hungarian Abbot, Gregor Mendel offered the world the laws of genetic inheritance. A century later DNA was discovered on both sides of the Atlantic. All these "discoveries" were such gigantic steps that by the 1970’s, the new science of biotechnology was prophesying the end of illness, hunger, pollution, resource shortage and even the end of death!

The days of exploration are not over. In Tanzania, Livingstone may have “discovered” Lake Tanganyika, but it is time for the professionals, the schooled and those unfortunate not to attend classes, to be aware
of the rich heritage to be found in the wetlands, the savannas and the drylands, the deltas and the deep ocean. But the discoveries also mean looking at the creativity of people and entire communities through their culture and management of their “environment”. The vegetation and fields in the rural areas can be regarded as gardens and as laboratories for short and long term experiments. While University based taxonomists may be rare in Tanzania as elsewhere in the world, the country used to abound with culturally rich naturalists. Every ethnic group had a full complement of names of plants, insects, food crops, observations and conventions. Would it be too much to make a case for such knowledgeable people to be incorporated at least as para taxonomists? True, scientific changes in the last two decades alone are awesome. Ironically, the potentialities and dangers were foreseen by a few national figures including the late Member of Parliament for Morogoro, the Honourable Amir Jamal. Fortunately, we have a record of what he thought.1

1.3 The late Jamal's legacy

In the late 1970’s against the background of Dag Hammarskjold Foundation’s strong belief that "peace and development" were indivisible, Ambassador Jamal, than Tanzania’s representative at the United Nations, in Geneve, and as a trustee of the Foundation, was appointed Chairman at a symposium for Third World representatives invited for the deliberations on bio-technology. In a statement he noted that the Foundation which had "initiated, stimulated and organized basic work and thinking in the fields of human endeavor at the heart of which has been concern for global development...", especially in the Third World and Africa, and this depended on the contribution of "countless dedicated men and women". He noted that while biotechnology could bring benefits as well as setbacks. "Its potential for bringing about swift and widespread amelioration of man is only matched by its potential for even swifter and more widespread and destruction of man and his environment". His vision directed him elsewhere.

For as Jamal noted "...Capital combined with science and technology when given free play in the market may succeed in developing the most efficient techniques to shortcut evolution and natural selection". It may, however at the same time create great social and economic consequences for the disenfranchised vulnerable section of humanity with little countervailing power to safeguard their short term as well as long term interests." "Biotechnology offers the potential to displace traditional agricultural commodities on a massive scale." These were not mere speculations. He gave the example of Madagascar where 70,000 farmers, who produced three quarters of the world’s supply of vanilla and earned $50 million, literally overnight were replaced by a factory in the USA!

But his message to the scientists and I might add, researchers too, is in my opinion tailor made for this LinKS programme. He noted that, "They (researchers) must increasingly share actively in the policy-making of nations, so as not to subvert the laws of life itself. No longer will it be possible for them to leave it to the politicians who only take a short term and a parochial view of their responsibilities." I have wondered whether, the late Ambassador Jamal, the Chancellor of Sokoine University of Agriculture, when he so optimistically suggested such a critical role for scientists, whether he also included those in his own country? If we just take the last decade, I think we have had a few false starts.

1.4 Recognizing false starts

Can we honestly say that the Biodiversity Programme so enthusiastically executed by the Food and Agriculture Organization was really nurtured by nationals in national interests? It was good only in places, but was subverted in several other places. For instance, at the implementation stage in Tanzania, a sub-project to bring together scientists, researchers, bureaucrats and professionals was derailed. Instead of working together to become aware about the knowledge and information on the fabulously rich endemic biodiversity of the Eastern Arc the project, under a "new management" simply deteriorated into an opportunity for a few to regularly harvest their per diems. The major product was cartons of photocopies of articles! Yet when the exercise was conceived it was with the conviction that local academics, scientists and bureaucrats should not only work together but should move together with the opportunities provided by Information Technology. Do you know that in 1992, there was not even a PC

3 Jamal’s ‘Statement’ appears in the Development Dialogue, 1988, Dag Hammarskjold Centre, Uppsala.
in Kibaha, the capital of Coast Region! The Regional Forestry Officer had to rely on his memory and his school days to carry out his functions.

If that was bad then, I wonder today who is in charge of studying the biodiversity of Lake Victoria. Perhaps the University of Arizona, but not the University of DSM or SUA or University of Bukoba. Let us move west, who is studying the incredibly rich (after Lake Nyassa) biodiversity of the Lake Tanganyika? Once again it is not our centres of learning but a consortium of UK scientists. With this trend and our national indifference, the Global Environmental Facility could well become an avenue for scientific domination. Will all this information collected so freely be also available freely?

We could begin to know the magnitude of our task and could better plan our strategy if we at least know some of the major constraints that we face we perhaps will have less excuses of not doing anything.

2 POTENTIAL PROGRAMME CONSTRAINTS

The programme constraints that will have to be faced are very wide ranging and fundamental. Partly they have as their basis the duality that is deeply entrenched between urban and rural, rich and poor, the powerful and the vulnerable, those with formal schooling and those without. Generally the cultural and perception determinants are pervasive, not well researched and difficult to handle. But the programme constraints could also be about the abuse of people’s rights over land, misuse of power, lack of democracy and participation etc. The constraints being presented in this paper are not arranged in any order of importance but unchecked they all lead us to the same possible consequences: - erosion of biodiversity, destruction of habitat and genetic resources and growing food and environmental insecurity, injustice and unnecessary scarcities, and even violence and wars. Can laws and policies ameliorate the unstable conditions? Perhaps only to a certain extent, if there is no civil participation,

2.1 Regeneration or destruction

Contrary to popular opinion, the constraints have their origins not only externally but also from internal sources. At the core of the problem is the chasm between formal, compartmentalized modern science and traditional knowledge systems (TKS). In this respect Shiva’s perception on how regeneration has been hampered by patriarchal thinking provides an important framework for this study which has a gender dimension. A dichotomy has been artifically created in which there is division between activity/spirituality/culture as typically male characteristics and passivity/materiality/nature are regarded as female characteristics. This artificial dichotomy has been used to intrude into the whole process of regeneration to replace it by divisions and even destruction. Persuasively she illustrates the parallel aspects of both biotechnology and the medicalization of human reproduction. Biotechnology robs seeds of their regenerative capacity just like medicalization fragments the female body so that professionals can manage birth and even find replacements (Shiva 1992).

2.2 Contradictions

If the promises of science are truly for humanity then what tools are needed, can traditional or conventional technology be used to bring about equity? In the latter case, "...Unfortunately in the current economic and political environment, these techniques are much more likely to be used to concentrate political and corporate power." Therefore how should it be regulated? Many will also appreciate the contradictions that are inherent if attention is only focused on agricultural yields per unit area. For instance, the technology for breeding high yielding varieties is therefore the technology which breeds uniformity and could even threaten the total collapse of yields (Mooney, 1998; Shiva, 1992). The recent plight in the coconut industry or for that matter the periodic scares about some of our maize hybrid seeds are all pointers to the dangers of uniformity.

One has to cope with a whole set of contradictions both at the global and national level. At the international level there has been a great deal of debate about ownership and rights. It is a glaring fact
that while the North is food rich this has been on the basis of material collected from the genetically rich South. Should this diversity be destroyed to skyrocket the profits of a multi-national corporation?

2.3 Lack of persistence in our demands

The development of veterinary biotechnology in most African countries is hampered by the lack of basic equipment and expertise. For example, a decade ago, it was stated that "Sokoine University at Morogoro, has plans to undertake a wide range of biotechnology research and establish a tissue culture centre. The Veterinary Department of the University would like to venture into embryo transplant but cannot do so because of limited expertise and lack of basic equipment..." (Clark & Juma, 1991). A decade later is the equipment and expertise there? Probably not. Scientist and researchers in Africa need to be more persistent in their demands. The refrain from governments that "we do not have the funds." has been all too easily accepted.

There has been little concerted investments in agriculture research in Tanzania. Where promising initiatives were taken they have been derailed, for instance in the sugar and sisal industry. In cases where funds were obtained there was a great deal of misuse. But there is a danger of dwelling exclusively on the negative and ignoring some positive trends.

Perhaps the current showpiece is the research on cashews. The literal collapse of production from 145,000 tons in the early 1970’s to 16,500 tons in 1986 goaded action. One of the reasons for the near collapse was disease. The pathogen causing mildew was identified and soon the treatment could be prescribed. Naliendele Agricultural Research Institute in Mtwara has been the focal point of research. Assistance from Italy, Germany and the United Kingdom was critical in the initial stages of the National Coconut Development Project (NCDP) and Cashewnut Improvement Programme (CIP). Lately a modern laboratory has been furnished to undertake research in molecular biology and biotechnology is already functional at Mikocheni ARI in Dar es Salaam. Fingerprinting of cashew accessions has already started. Significantly, more than any in other development there are now 14 PhDs and 23 MScs in the Coconut and Cashew Tree Crops Project. Along with this promising developments the research is being financed through a levy from the industry itself. Dramatic as the up swing has been there is no room for complacency rather there is the necessity of branching into new areas. The industry in the past nearly collapsed, there were also social and management issues which have to be addressed. (Box 2)

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**Box 2 Increasing The Benefits From The Cashew**

The cashew has with the last 75 years become one of Tanzania’s major export crops. Classically it has depended on what the late Jamal described as the contribution of "countless dedicated men and women". Unfortunately, there has been comparatively little science or ethnoscience which has been directed to complement the efforts of the dedicated peasants.

The cashew (*Anacardium occidentale* L) is native to Central America and especially north eastern Brazil which has a large base of wild species. Portuguese colonizers diffused the crop in the sixteenth and seventeenth centuries to Eastern Africa and beyond to India and to other parts of South Asia. In India the genetic base was dependent on a very few trees (Rao 1997).

The cashew trees in Tanzania probably have a slightly larger genetic base but until recently, after the epidemic of the powdery mildew disease and the turmoil brought about by villagization, there was little...
investment in research. Export production of some 200 tons in the 1930’s dramatically rose to 145,000 tons in 1973 and then plummeted to less than 16,500 tons in 1986. The sulphur treatment of the trees has brought the disease under control and production has now crossed the 100,000 tons of raw nuts which are exported. Cashews are mostly grown in the south east of the country but for a number of reasons have now begun to spread. Although Tanzania is the third largest producer of cashew nuts and on this tonnage it probably realizes only about a fifth of what it should really be earning. It is estimated that some 280,000 households (hh) are involved on some 400,000 ha of land (Majule, Topper & Nortcliff 1997). This means a yield of approximately 250 kgs per ha or 357 kgs per hh. Making allowances for everything these yields are low per ha and per hh. So how can investments in research and science help? What are the benefits from globalization?

Although most of the people in areas where cashews have been introduced are aware of the Anacardium occidentale, even until the 1950s it was assumed that there were 8 species of Anacardium, while the Index Kewensis now lists more than 20 species. One of the species Anacardium giganteum found in Surinam has an apple that weighs 200 gms, which is more than 4 times larger than those found in Tanzania; there are germplasm accessions in India that have flowering duration’s of 40-127 days, harvesting duration of 30-105 days, nut weights which vary from 2.4 g -18.0 g and kernel weight from 0.5 to 4.5 g and mean yields per tree of about 10 years which vary from .80 to 11 kgs. (in RAO 1997). Few in Tanzania actually appreciate that like in most parts of the world cashew trees were planted mainly for the rehabilitation of wastelands and as a cheap means of afforestation. Under normal conditions from seedlings the canopy of trees can reach a diameter 20 m and there are records of 25 m; the height also varies from 6 to 12 m. This has a great deal to do with spacing. Commonly the spacing densities vary from 28 - 70 per ha. In other countries densities of up to 2500 and yields of 2000 kgs per ha have been attained. When densities are high and the trees are propagated vegetatively rather than through seedlings the root system develops differently and the plant can be dwarfed (Behrens 1997). Grafted trees are more precocious than seedlings (Kasuga and Martin 1997). Varieties which are high in protein and low in sugar are preferred. A quality index for the type of preferred nut has been developed (Nagaraja 1987 a&b quoted in Rao).

The implication of the above to livelihood of people should be clear: dwarfed trees are easier to harvest, bigger seeds and kernels saves on labour but this may not be the only criteria to use; the role of the cashew in specific locality should not be taken for granted.

If the Anacardium was introduced to Tanzania, more than 400 years ago under the first wave of globalization, it is imperative in the current process of globalization that Tanzania takes advantage of progress in science, knowledge and information to ensure that people benefit more from the cashew than they presently do. This not only requires scientific knowledge but makes it important to collect the social distribution of knowledge of the cashew.

2.4 The limits of the market

Rapacious commercialization means that the seductive promises made about virtues of the free market have to be critically appraised and find whether the real benefits that poor countries are supposed to get really get to the poor. Growing commercialization will not fuel investments in biodiversity. Because any user benefits from investments in their conservation, market forces will lead to less conservation than its value to society warrants. Indeed, as the Kenyans discovered, unregulated biodiversity prospecting by multinationals and their agents can speed genetic destruction. In this particular case the entire adult population, some 27,215 kgs, of Maytenus buchanantii, a source of the anti-cancer compound, maytansine was shipped out by the US National Cancer Institute (WRI 1993).

Commercialization may work against sustainable resource use in perverse ways but the market could also help in sustainable development. For instance, Lindberg writing about Babati District, noted that in the early 1990's fertilizers became too expensive and peasants abandoned cultivating maize as a sole crop. Instead they resorted to inter-cropping and went ahead to plant pigeon peas and other crops (Lindberg 1996). The pigeon pea not only fixes nitrogen but it also prevents post-harvest grazing because the plant remain in the ground for some time, it protects soils, and the residual from it can be used for animal feed or domestic fuel. One of the valuable lesson from this case and other well documented cases in Asia, is the multiple role and impact of local food plants in the agriculture, economy and health of the local people.
Despite all the rhetoric about the need to conserve biodiversity the fact of the matter is that the benefits have been less to the conserver. In Tanzania, the classical case is *Saintpaulia* or the African Violet which is endemic to the Eastern Usambara. Of the twenty or so species so far classified, 11 are from the Usambara (Mather 1989). So far billions of dollars have been generated for the companies in the North from the base material derived from the tropics. Returns to Tanzania after almost a century are effectively nil!

### 2.5 The running down of institutions

Critically, important scientific sectors are beginning to be run to the ground and the biological sciences are the major victims. The world-renowned Serengeti Wildlife Research Institute, after years of neglect now hardly has any nationals working in it. Ironically, this comes at a time when an ultra modern laboratory has been installed. Tanzania is among the richest countries in the world for large and small plains animals.

Generally, the alleged economic recovery seems to have little impact on the financing of research institutes. This is partly a result of squabbling, in-fighting and a lack of professional interest. A few weeks ago I was asked for the name of a Tanzania fish geneticist, urgently required by an Australian team. The knowledgeable people I knew were all "out of the country." It would seem that it is not only our primary education that is in crisis! We have to seriously rethink about capacity building programmes at all levels.

### 2.6 The magnitude of poverty

Tanzania has financial constraints but few appreciate the sheer magnitude and implication of this problem. Currently, with all the improvements to the economy, the exports mainly from agriculture total to less than $ 700 million per annum and there is a deficit of more than $ 400. Debt repayment is extremely high. The average per capita income is only slightly over $ 200, or about a 1000 times less than the per capita incomes of some of the richer countries. At the household level the majority do not even have the proverbial 1$ a day!

When this level of incomes are matched with the levels of investments being made in bio-technology, it is possible to see the magnitude of the constraints. It is estimated that to get out a commercially marketable drug requires an outlay of US $ 231 million over a 12-year period. Even then there are no guarantees of return to investments. The likelihood of discovering valuable compounds is very low. Only one in 10,000 may contain a promising lead and the US National Cancer Research Institute continued work on only 5 from its sample of 33,000 extracts. On the basis that research laboratories are taking high risks developing countries get very, very little for their genetic raw materials. Although the earnings of the pharmaceutical by 1993 had exceeded $ 200 billion the returns to the developing countries was negligible. It is estimated that developing countries could at most expect to earn royalties not exceeding $100 million. But this is anticipating that the negotiating skills of the bureaucrats are highly tuned and ethical.

Screening techniques are becoming faster and more accurate so that promising leads could come with about 1000 samples. We are entering into a field of great controversy but clearly Africa must negotiate for better rights than in the past. It is unlikely that Governments from the developing countries on their own, for various practical reasons could negotiate and gain the maximum. Strategic partnerships, with citizens groups and other activists could help.6

6 One genetist returned. A combination of bureaucracy, sheer indifference on the part of the Faculty and “let us fix this guy syndrome” has meant that students in this centre of education have not benefitted from trained and qualified staff.

7 The most successful alliance in this respect was the NGO lobby from the North and South at the World Trade Organization meeting at Seattle, late Nov 1999; subsequently there were similar protests at Davos (January 2000) and Bangok (February 2000). Perhaps all these cases demonstrates that Fazal may indeed be right. In Tanzania, matters of food security and the debt issues, in preparation of the Seattle Meeting, was organized by the CCC.
2.7 The restricted view of biodiversity/food security

There is a tendency to take a rather restricted perspective of biodiversity. In trying to understand biodiversity we should also pay attention to habitats and their sustainable use. Biodiversity concerns should also incorporate the diversity of environments, or habitats including the various life supporting niches like creeks, ponds marshes wetlands, forests, thickets, grasslands etc. Another obvious area that we have overlooked in Tanzania is agro-biodiversity. The range of varieties of bananas, mangoes, sweet potatoes etc is large. This agro-biodiversity is a resource which we should try to conserve. Also overlooked are the countless micro-organisms which though innocuous are important ingredients in the food chain. Also underestimated is the diversity to be found in the wildlife and domesticated livestock. Since they all feed naturally on the range, they give us valuable lessons on the peaks and declines of the carrying capacity of different sections of the range.

Finally, there is the real danger to culturally ignore the diversity of indigenous knowledge. For instance, among several communities there are strict censures against cutting certain tree species. In Dodoma the *acacia tortilis, adansonia digitate,*8 in Lushoto the *ficus thonningii* are all protected and traditionally required a sacrifice of a bull or goat for any infringement.

Unfortunately, at present there is also very little coordination of this knowledge. There is no way that one can for example be certain that the following indigenous rice seeds, *Joho, Buga, aga,a, Dunduli, Faya Bungale,* found in Kilombero District, are five different varieties or one variety with five different vernacular names. In Ifakara, farmers used 11 different ways to identify and record meteorological information for agricultural use (Lugeye, Haule and Shio 1999). These indicators included stars in the sky, activities of ants, availability of specific types of fishes etc.

3 THE WAY AHEAD

The above constraints are formidable and unnerving. I believe that it is darkest before dawn. The path ahead is full of hard work and requires a massive amount of reorientation in the way in which we think and work. (Box 3).

Perhaps if we take an ecological approach we will be forced to recognize that the disharmonies and harmonies in our interactions with nature. For:

“....Understanding and sensing connections and interrelationships is the ecological imperative. The main contribution of the ecology movement has been the awareness that there is no separation between mind and body, human and nature. Nature is constituted in the relationships and connections that provide the very conditions for our life and health. This politics of connection and regeneration provides an alternative to the politics of separation and fragmentation that are causing ecological breakdown.....”


The approach of the programme should be to unite, not to divide, to understand rather than to impose, to respect rather than to abuse. It is necessary to tear down barriers rather than erect them. Understanding also means not trying to be deterministic. It is quite surprising how many will attribute poverty for instance to the physical environment. In such an outlook, the poor are found in the arid areas, the rich in the highlands etc. It has been argued that since poverty is a human condition, our analysis should recognize the interplay between the physical and cultural/social environment (Mascarenhas 1994)

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8 The protection of the *Adansonia digitate* is not surprising. The plant has many uses including its flowering pattern as an indicator of rain!
Box 3 The Need For Re-Orientation

Rural societies, indigenous people, the South - will not find it easy to benefit from the biological resources that have been nurtured and developed through their care and genius. Not only must they overcome long-standing Western scientific prejudice; they must also rectify recent intergovernmental agreements and defend the origins of living resources. This is possible. On the basis of South - North; on the basis of what Nyerere used to call the Trade Union of the Third World, there can be benefit-sharing. If, however, the North divides the South and forces it to negotiate country by country and specimen by specimen, than the South will gain nothing.

If we are to respect Traditional Knowledge Systems there is need for such a degree of flexibility, which is so great, that there will be great fear of things running amok and cries of "corruption". How can one employ a person who is unschooled as a para taxonomist? Yet, this individual probably speaks and understands several vernaculars and more important can identify dozens of trees, shrubs and grasses.

We have to broaden and empower our membership to do something about our indigenous knowledge. The colonial practice of excluding such individuals must cease. Mooney (1988) has argued that “The perception that intellectual property is only recognizable when produced in laboratories by men in lab coats is fundamentally a racist view of scientific development” Some of the top taxonomists in Tanzania even now are not graduates. Their contribution would have been even more valuable had they been allowed to enroll at the University, train others etc.

3.1 Livelihood - Food links

Most if not all livelihood groups in Tanzania and elsewhere have the major part of their food chain dependent on the environment and the natural resource. If we work in the framework of livelihood systems we incorporate, the environment, the biodiversity, gender and the food security and even the economic aspects. For instance, in dry grassland areas with an erratic rainfall regime, keeping of livestock makes environmental sense, similarly in mangrove areas dependency on rice, fish and the like keeps a rhythm that is in harmony with the dictates of ecology. In such flood prone areas the tall varieties of rice are more adapted to the problem. If we also paid attention to the process of getting food for the household we would begin to discover the distinct role between the genders, the supplemental foods consumed and why households have or do not have food security.

Most of the self-provisioning livelihood communities still have a wealth of information of wild plants used for food, medicines, dyes and other uses. Several of the plants are consumed during period of stress, such as droughts and floods. This type of information is important for they represent options when floods and drought do strike. Little work has been done on the food value of these plants. To create an enabling environment, fairs for seeds and planting material should be encouraged throughout the country. Formally, only Mtwara Region has this on the agenda.

3.2 Paying attention to the obvious

There is a great deal of room for paying attention to the obvious rather than just with the esoteric. A major candidate here is the livestock. With about 13,000,000 million head of cattle and as many goats, sheep, donkeys and camels, Tanzania has the second largest livestock population in Africa. If to this number one adds all the wildlife, which in many places co-exists with domestic creatures, then the animal biomass is very great. Yet there is a steady decline in the consumption of meat in Tanzania. There is a tendency in Tanzania to overlook the livestock sector. This needs to be redressed. Not only is the sheer size of the livestock impressive but little is known about the diversity especially that of the goats and sheep. Generally, there has been a tendency to underestimate the contribution of livestock to life in the rural area including their role in diets.
Here too mention must be made about the distinct role of men and women in the survival of the pastoral community. Yet, despite the few recent books about women, most of the information and image of the Maasai is about the warrior man.

It is surprising that after a hundred years of intervention, "... few range management projects in dry Africa have had a discernible, positive and permanent impact on the way communal rangeland is used" (Behnke and Scoones 1993). Most of the failures of formal pastoral schemes have been the excessive scientific orthodoxy’s. Concepts of carrying capacity both of human population and livestock have been manipulated to suit the needs of vested groups including conservationists (Bell 1987, Niamir 1990, Behnke and Scoones 1993). Traditional Knowledge Systems based on heritage and experience and which demonstrated practical options and which was the basis of range management by the pastoralists was completely ignored. Pastoralists in Tanzania continue to be ignored.

It is being suggested that to redress past prejudices, concepts like carrying capacity, land degradation, and range management be looked at afresh. With the studies already available and new scientific techniques it is possible to offer pastoralists a far better deal than they have experienced in the past. For instance it is now possible through botanic observations to assess the health of the range, lessons could also be learnt by range ecologists from wildlife population biologists about carrying capacities for domestic animals (Behnke et. al. 1993).

3.3 Respect for history and knowledge

For proper decision making there must be respect for both history (and pre-history) and knowledge. One of the most remarkable features about pastoralism is that it represents a very prehistoric livelihood arrangement whereby wildlife and livestock could co-exist without destroying their habitats. This system has undergone a major transformation, including the domestication of animals. Has the process stopped or if we wait long enough will we see the domestication of the ostrich, guinea fowl, eland, dik-dik?

The inter-relationships between environment and human beings is varied and complex. Biological research work which should have been the basis of decision making by administrators, donors, social scientists including economists was seldom applied in range management. Similarly, it is forgotten for instance that Eastern and Southern Africa experienced livestock devastation as a result of the rinderpest pandemic outbreak of the 1890's. However by the early 1940 there was gradual recovery. Natural processes, including drought and disease periodically curbed numbers even without the intervention of the government and pastoralists have tried to bring some sort of stability but not with much success. Overall they are losing not because their management of the range has failed. It is more a combination of conflicting interest over land, pasture and differing perspectives of old and new stakeholders.

3.4 Re-evaluate the importance of traditional foods

In the context of our topic of discussion there is a need to pay attention to the term traditional foods. It should be noted that some of the local varieties of some of our conventional staples: rice, maize, millets, cassava now form part of the traditional foods. Other dimensions of traditional foods are those that are collected either in the forest or bush or which are gathered from the fields, near homes or along paths. Furthermore, most of these traditional foods are supplemental, they could enhance taste and are a source of supplemental vitamins and even of medicinal value. It turns out that of the most common causes for dietary deficiencies appears to be the decreasing diversity of traditional diets. The assumption that with increased incomes diets improve is simply not true.

There are several aspects of traditional foods which needs to be emphasized. First and foremost it broadens the food base; secondly, it enhances the nutritional status of the local communities; thirdly, they give food security during critical periods, fourthly they could increase productivity by conserving soils and also increase soil fertility; fifthly, they protect household incomes and national incomes. Basically, an enabling environment is created when we begin to give value to traditional beyond their immediate geographic domain.
There are already a few initiatives that have been taken to collect information on traditional foods. One such initiative is Uluguru Mountain Research Agricultural Development Project (UMADEP) which is based at Sokoine University of Agriculture, The Extension services of the Ministry of Agriculture and farmers in Mgeta and Mkuyuni Divisions (Mattee and Lassalle, 1999), still others are involved in collecting indigenous knowledge and natural resources management (Kajembe and Rutatora 1999). Unfortunately, there is very little effort to coordinate and to network.

3.5 The momentum of the project

Every project must have a momentum and this should be capitalized upon. The two reports of the consultants, the legal framework by Kaiza-Boshe and Koda’s contribution on the research agenda gives us some perspectives about the situation in Tanzania. At the same time they point to the fact that a great deal still needs to be done.

The project envisages a regional outlook and collaboration and this is important. However, with years of controversies and recriminations and counter recrimination the international dimensions cannot be ignored. However, given that information technology is gradually being established, it is necessary to be aware of the latest debates and emerging issues. The interactions from the encounters at different meetings should enable the network to expand and if necessary re-focus. If the agenda becomes too cluttered this is the time to come up with priorities.

3.6 Enlist the active participation of communities

Most communities in Tanzania have mainly been at the receiving end of information. However, greater democracy has meant that people can now participate freely without fear of not conforming to the views of one or any of the parties. Local government reforms also could mean greater participation. These opportunities should be seized and the project should enlist the active participation of people. This requires more listening than telling.

There has also been a tendency to disregard the infrastructural and social needs of the communities and to have a very stereotyped attitude towards their needs. For instance the pastoralists should have the same rights as other citizens in education, health, etc. But in the process of meeting their needs it may be necessary to re-examine alternate forms for the provision of these social services, including agricultural extension, food and nutrition and education, etc. Recently in a workshop on Food Security for pastoralists in Ngorongoro a delegation of Maasai from Endulen, categorically stated that the food security of their children was through education, not food handouts! Education for them started with nursery school. Such expressions of change are not backward looking. Indeed participation can take many forms.

3.7 Retaining local knowledge

Part of the insidious legacy of colonialism has been the destruction of cultural diversity and the ascendancy of the values and the norms of the rulers. Yet, some of the major faux pas occurred because of the brash belief that technology could resolve all problems. The infamous “Groundnut Scheme” located mainly in Tanganyika, was abandoned by the British Government by the early 1950’s, when the weather, the soils the seeds and even the equipment all conspired to reveal that nature has to be understood. Beyond this, throughout the region, the ability of people to read and interpret the signs of nature have been critical for the sustained use of natural resources. This is what makes them survive and seek for alternatives within their own micro or macro-environment. Over many parts of Tanzania people have survived because they have harnessed traditional knowledge - this is a feature from the Rufiji to Rukwa and from pastoralists to fishing communities.

Use of traditional knowledge represents low capital input systems. For instance by the World Banks own admission, most of the development projects in Africa on pastoralism were a failure because they were managed on models which made sense in the American or Australian systems. A critical concern to the traditional pastoral system was to recognize the necessity to cope with aridity and drought. They have
skilfully developed and managed to use their traditional knowledge systems (TKS) to exploit the environment to an astonishing degree. This is now well documented (Niamir 1990). Unfortunately, pastoralists are a minority and their views are seldom considered. Perhaps there are limits to democracy and there is need to pay attention to the rights of minorities.

But in defending TKS, there is need to emphasize that the argument is not simply to substitute TKS for modern science. They should co-exist and complement each other. Third World countries become the biggest losers when they ignore science, traditional or modern.

3.8   Paying attention to the interfaces.

There are several interfaces which require attention. Specific for this programme is the interface between the modern and the traditional. For instance plants in use by local people in the Rufiji Delta, that can tolerate saline conditions and which are a source of food could provide clues to the direction that scientists should take. Given the scarcity of fresh water and the accelerated population growth in the coastal areas of Tanzania such pointers are of great significance to the food security of many communities. This would mean that land around several inland lakes in the Rift, which presently remain unused, could support additional people.

At another level there is the interface between the economic and social. For instance, are households producing cashews headed by women or men different in the way they use their incomes? Since cattle in many pastoral communities are regarded as the property of the men, how would the introduction of milk goats to women help in poverty alleviation?

3.9   Broadening and increasing the science base.

On a very broad front there is need to deliberately intervene and where necessary to integrate the science base. In practical terms this means respecting and moving towards a greater understanding of TKS rather than being oblivious to it. Generally, in Tanzania, the application of science to development has not been purposeful or undertaken with resolve. The situation regarding the use of biodiversity potential is in a stage of infancy. The proud achievement of the 1950’s and 60’s in the sisal industry, which even went to produce a high yielding hybrid remain unmatched. Both Kenya and Uganda have gone streaks ahead in paying more attention to crops like the banana and coffee and have economically gained from these investments. Land races in rice and coffee, not to mention mangoes and bananas have literally been neglected in Tanzania, and as the case study on the cashew demonstrates, all this at a heavy price (See Box 2).

If LinKS is to make an impact, it would seem that it is necessary from time to time to take stock of the changing circumstances. Will the continued use of sulphur acidify soils to the extent that it will affect food and nutrition of the people? Are there alternative ways to tackle powdery mildew disease? By collecting samples from villages, staff from Naliendele ARI have found that some trees are less susceptible to mildew attack. This interaction between research centres and reality is important. In a socio-economic sense, is it not time that people are made aware and benefit from the other bye products, such as the apple of the cashew? This would open up whole new areas of opportunities for enterprise and development.

Box 4   FAZAL’S VIEW: Our Strength By Counting Our Blessings

Care. We have learned to use our extremely finite human and financial resources with incredibly greater efficiency than corporations or governments.

Consistency. We have shown that we can keep to an issue, that our institutional memory (at least by comparison) is much greater than those of the other system and that the individuals that comprise the
Third System can embody experience and expertise than those in corporations or governments.

**Context.** We have developed a more holistic vision of where we are going and can analyse and contextualise issues in a more realistic framework than can those we find ourselves opposing.

**Co-operation.** The score and pace of our co-operation has increased massively. We use fax, e-mail and the Internet with growing effectiveness. We know one another as we never used to. The community of co-operation has also extended beyond the wobbly matrix of classic ‘development’ and also ‘environment’ CSOs to Indigenous Peoples' networks, organisations of the differently abled; the women's movement; youth; strong association's of the elderly; and other genuine People's Organisations.

**Connections.** Unlike governments and corporations, we are able to sustain a mutually valuable flow of information and experience between on-the-ground community realities and multilateral UN policy fora.

**Conviction.** We have the moral high ground whereas those working for the other systems rarely have our loyalty or commitment.

**Credibility.** In general, we are not seen to be self-serving in the way that government and corporate spokespersons are seen by most of society.

### 3.10 Keeping a code of conduct

Participants in the present exercise should regard themselves as part of a civil society organization (CSO). Our strategic consideration should be fourfold: First to respect and incorporate African values, knowledge systems and priorities; secondly involve local people in the management of local resources; thirdly, reverse the loss of biodiversity and food insecurity; fourthly, treat biodiversity and economic development as an integral part of development (WWF/CI/WRI).

But beyond the above noble objectives, it would be fatal if the whole activity was undertaken without the self-confidence that we are embarking on something important. After years of being undermined it is important to be conscious of our strengths rather than inflate our weaknesses. The strength of Third World groups working together is well portrayed by the activist Fazal (Box 4).

Briefly, we should as a group observe the following commandments outlined by Fazal: "Care" We (as a CSO rather than a Parastatal) have to learn to use our own extremely finite resources with greater care than corporations and even governments; "Consistency" keep to issues, because of greater experience and expertise; "Context" should be holistic; "Cooperation" especially with local and indigenous people; "Connection" sustained and valuable flow of information; "Conviction" on moral high ground; "Credibility" not self serving.

These are not modest tools for civil society. To this list, we could add a number of things that we are not. Most prominent among this category is that we are not homogenous or monolithic. Our diversity is a strength, especially because we still share broadly similar social goals but we approach them from so many different points.

### 4 CONCLUSION

The evidence provided throughout this discourse points to the importance of running the activities of the programme with an acute sense and awareness of the need for transparency and democracy. As democratic principles establish their roots in Tanzania, it will increase participation and lighten the burden on the government and make it more responsive to the needs of the people. But this pre-supposes that democracy and respect exists in the relations between men and women, old and young, between rich and poor. This cannot be taken for granted. The relationship of self-provisioning communities is very fragile, irrespective of whether they are pastoralists, hunters or fishing folks. It will be recalled that the livelihood of many communities in the Rufiji Delta and all their biodiversity were almost compromised.
by the influence of one investor - that was a close save! But there is also violence against women and this is condoned on grounds of “tradition” by several communities in Tanzania and at meetings this causes twitters rather than outrage.

This democracy and participation must also extend to the institutions that have agreed to collaborate. Walls and blinkers around institutions can be a problem. I am sure the significance of this is not lost on the Tanzania Food and Nutrition Centre, given its near links to the Prime Ministers Office, its affinity with sections of the Ministry of Agriculture and its formal links with the Ministry of Health. It should be congratulated for taking the lead role. Networking among institutions should not be left to chance but should be fostered so that a culture is nourished: for sharing, supporting and even collectively succeeding.

There is another element of strength in the present set up and that is the presence of NGOs and civil organizations. The debates on bio-piracy, on the farmers rights to seeds, on the attrition of agro-diversity and the challenges and dangers of bio-technology, have been enriched because of the civil organizations. By challenging the conventions and complacencies of international organizations these NGO’s have become the conscience of the globe. They have helped people to think about ethics and the rights of others. True, some of the activists, (including those who splash pies on the face), may be polemical and controversial but given the greed, the injustice and the millions of dollars that are involved there was no other way to bring the powerful message to sink in the minds of all. The works of Mooney, Shiva, Khor and a whole host of others should be a back set to remind ourselves about the realities and issues pertaining to gender, biodiversity and food security. But there are also academics and people from established institutions, (Sen and Chambers on poverty) whose contributions have jolted the consciences of the rich and powerful.

One welcomes the helping hand and the rich experience of the Food and Agricultural Organization. Given that our planet is now a global village, what happens in Tanzania or in this Region can influence the rest. While we have been accustomed to hearing messages to save the rhino and the elephant, the other life forms; the habitats and ecological niches, the wild fruits and plants and other creatures have largely been ignored by our “establishment”. Perhaps having FAO associating with NGOs will give them the “respectability” to remove vestiges of inhibitions so prevalent among some bureaucrats and politicians. Given the cultural diversity of Tanzania and now enlarged to incorporate other countries in the region, it is important that we learn from within and outside the country. There is a need to redress the balance, the cultural diversity of Tanzania needs to be understood and appreciated. The Warufiji, the Maasai and the Hadzabe may have a lot more to contribute than we care to admit.

There is need to be aware of the major discrepancies and contradictions in the whole sphere of biodiversity and food security and to find who gains and who loses. The social aspects of the programme are as challenging as the physical realities. The custodians of biodiversity need to capitalize on traditions that they have passed from generation to generations and from which we have benefited. There is no reason to punish those who seem not to conform with the convention indicators of a “developed agriculture”. There is no need to perpetuate further erosion of agro-biodiversity nor to minimize the returns to the custodians of diversity. Traditional knowledge and the contribution of the real custodians of biodiversity and food security, should be respected, as their right. The third aspect necessary for the project to succeed is the need for openness and for greater and meaningful participation. There is reason to be concerned about scientific and economic orthodoxies.

Those who participate in this project, especially the scientists and researchers have a huge responsibility. This responsibility should be used in the spirit of democracy, help to eliminate the existing discrepancies and ensure that the most vulnerable people on this planet, Africans, will really benefit from knowledge they have and which they can share with others. Elitist attitudes that only respect those with lab coats, land cruisers and computers and ignore knowledge obtained from fields, gardens, observations will be losing valuable opportunities of blending traditional knowledge and modern science. To imitate the polarized models found on the global stage would be even more threatening to countless people who presently only succeed in eking out a miserable existence. Scientists and their partners in different
localities in Tanzania must have the freedom to bring real development in new and innovative ways which will reduce the threats to the vulnerable in their societies. Only then can the worst fears, that the benefits of science and knowledge is only the right of the rich the powerful, be contained and regulated and the great expectations of the late MP for Morogoro be fulfilled.
1 CONCEPTUAL LINKAGES

1.1 Introduction

This contribution is a result of a baseline study conducted in Tanzania in April-May 1999 and two workshops on gender, agro-biodiversity and local knowledge systems organized by FAO and Tanzania Food and Nutrition Centre (TFNC), held in Dar es Salaam and Morogoro on June 7 and 22-23, 1999. These are in turn components of a broader regional project on Gender, Biodiversity and Local Knowledge Systems (LinKS) whose development objective is to support the implementation of gender sensitive policies, programmes and participatory technological development for the in-situ conservation and sustainable use and management of agro-biodiversity for food security. ANNEX 2 provides an overview of the LinKS project.

1.2 Information used in the analysis

The information used in this report was gathered from both secondary and primary sources consulted during the baseline study conducted in few regions in Tanzania including Dar es Salaam, Dodoma, Morogoro and Arusha in April-May 1999. To a small extent, data was also collected from Zanzibar. The major input came from Dar es Salaam region where more research institutions, government ministries and NGOs were visited. Additional information was generated from secondary data accessed from libraries, documentation centers/rooms and individual researchers’ offices. (Summaries of consulted references are accessible at FAO office). Participants of the two workshops held in June 1999 contributed appreciably. Working definitions of key concepts used in the following chapters are provided in ANNEX 3.

1.3 Conceptualizing the linkages between gender, agro-biodiversity and indigenous knowledge systems within the Tanzanian context

Overview of the linkages between poverty, agro-biodiversity and local knowledge systems: cause-effect relationship

Tanzania is predominantly agrarian with crop farming as the main employer and income earning activity for the majority of Tanzanian women and men. Livestock keeping assumes the second position with pastoralism featuring prominently in a few regions such as Arusha and Dodoma. Despite abundant natural resources, including land, forests, minerals and water (from rivers, lakes and the Indian Ocean), Tanzania is one of the least developed countries in the world. More than 45 % of the rural population, for instance live below the poverty line.

Efforts to address the poverty issue at both individual and public levels are numerous. These include policies, programmes and projects initiated locally and sometimes with external induction. The currently implemented Structural Adjustment Programmes (SAPS) are a case in point where both positive and negative effects have been experienced. For instance the impact of the market forces, coupled with the genuine individual urge to harness available resources for poverty eradication have to a great extent exposed Tanzania's biodiversity to a less sustainable nature. Local efforts aimed at eradicating poverty

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have also affected the life of plant and animal species and even exposed them to the danger of extinction. Efforts which destroy the natural habitat include massive timber harvesting, expansion of farm-land in natural forests where indigenous tree species are cut down indiscriminately and without replacement. The poor technology, like firewood use in the processing of some cash crops, such as tobacco curing, has also led to intensive exploitation of forest ecosystems. It is in line with this argument that Van Vlaenderen (1999:2) conclusively contends that “As a result of development interventions, steeped in a modernization approach, as well as a general process of globalization, certain aspects of peoples' local and traditional knowledge are disappearing.”

Local knowledge systems and concerns of food security

Local knowledge systems deserve recognition in their own right as human attributes to development. Indeed, it is often argued that local knowledge is symbiotically related to poverty eradication. The contention is that local peoples' needs, values and capacities (skills) are related to both local knowledge and development dynamics (Van Vlaenderen, 1999; Koda, 1999). Both women and men have intimate knowledge of their natural environments which they have, at times used sustainably for generation while still preserving agro-biodiversity. In the past through this process local people were empowered for increased self-reliance, self-confidence and capacity for addressing issues of food security especially where the dynamics for combining old and new knowledge systems have been seriously addressed (Koda, 1999).

It is a truism that many of the contemporary farming systems that guarantee food security at the community level evolved from local knowledge systems. The case of the Matengo "pit" system (Ngoro) of the Matengo people of Tanzania which ensures soil conservation and hence soil productivityvalidates this contention (Rutatora et al., 1995). Yet this system is not devoid of gender imbalances especially in terms of distribution of workload, where an average of 135 and 40 hours per hectare is spent by women and men respectively.

The linkages between gender, agro-biodiversity and LinkS

The majority of Tanzanian women and men depend directly on natural resources for their livelihood, through farming, pastoralism/herding, fishing, mining and forestry activities. Rural communities also depend on natural forest products such as wild "foods", herbs, firewood, building poles and ropes/fibre, thatching grass, etc for meeting food, shelter, clothing needs and medicinal services for both human beings and livestock. As pointed out in the LinkS project document, women and men largely use their 'local knowledge' on local environmental and farming systems in their daily activities. Knowledge on edible and cultivable fauna and flora and medicinal herbs & shrubs for instance has contributed greatly to the development of currently used agricultural systems both in terms of production techniques as well as in developing processing, preservation and storage technologies/ facilities. Such knowledge has also contributed to the adoption of coping strategies during food shortages and at times of hardship, gendered knowledge on drought resistant crops wild foods and medicinal plants. It has equally assisted in ensuring both rural-based household food security, human and animal health and agricultural development.

(a) The gender dimension

The gender dimension needs further elaboration since it is the least observed aspect both in the culture of the indigenous people and by development practitioners and policy makers as elucidated by the research community (Koda, 1999). From time immemorial, gender has been a conspicuous variable in the allocation of roles, responsibilities and resources at both the household and public levels. For many ethnic groups for instance, the domestic domain including household chores has been confined to women.

Studies on rural development inform that rural women and men are better placed with respect to knowledge on local environmental issues and strategies of ensuring maintenance of the ecosystem. Knowledge on the many aspects of indigenous tree species such as timing for flowering, fruiting, growth, diseases of such trees, medicinal and nutritional values of local trees and even poisonous trees which are unfit for use by human beings and livestock is one such example (Koda, 1999).
Local Knowledge prominent in Tanzanian ethnic groups appears to be popular knowledge, yet it is relatively unevenly distributed. Because of its very nature of being closely tied to an activity where accessibility is determined by participation in related activities. Traditional healers, traditional birth attendants, farmers, livestock keepers and honey collectors for instance, usually access the relevant local knowledge and skills, followed by a process of experimentation, adaptation and propagation of new ideas gained through experience. It is also primarily the principle of "access through participation" which largely influence the gender dynamics in local knowledge systems.

Tanzania is a huge country comprised of 25 regions inhabited by more than 120 ethnic groups. Each of these regions and its people are unique in terms of geographical and climatic specificities, cultural norms, believes and practices and farming systems. Hence there is a wide variety of knowledge systems and social relations whose components are passed over from one generation to the other through socialization.

Essential variables in the socialization process include "gender" which is largely used to determine role specificity for women and men in all Tanzanian communities. Hence the gendered and unevenly distributed knowledge prominent in each ethnic group. While girls are socialized to become wives and as mothers and custodians of household food security, boys are tuned to become public leaders, decision-makers and planners for their house-hold's development and for public life. For the farming communities for instance, women and men will have the general knowledge on the farming systems, yet women would be more conversant with issues related to food crops and vegetables and the food basket in general since in all Tanzanian communities they are the ones who collect vegetables and process, prepare and cook food for their families, usually with the assistance of the girl child. Invariably, men would know more about hunting and related activities, housing construction (except for few ethnic groups which assign this role to women) and cash earning opportunities.

The social norms of pastoralists would tune women to accessing and controlling knowledge on milking and processing of milk products and tendering of calves and sick cows which remain at home (the woman is domain). The young men would be more knowledgeable on the best grass for cattle or best pastureland and related domains since men are the ones who move around with livestock for longer periods of time during dry and wet seasons. It is also said that during the initiation ceremonies of young male pastoralists such as the Maasai youth, sufficient time is allocated to training on issues of useful knowledge and skills on medicinal herbs (personal communication with a Maasai elder, June, 1999). The population in coastal areas on the other hand would have different knowledge systems since their farming system and life pattern involve knowledge on quite different factors such as the growing and caring for coconut and cashew-nut trees, cassava & rice. Necessary knowledge on diseases and cures for these crops would also be quite different from that of the pastoralist communities and vice versa. These are just a few examples to demonstrate not only the gender differences but also the ecological, geographical, ethnicity and age differences with respect to indigenous/local knowledge systems and agro-biodiversity. Activities such as cooking for the household members and associated activities such as firewood-collection and water totting have always been woman's role. It is hence widely argued that women know the type of trees ideal for firewood and for cooking & heating purposes, while men are more knowledgeable on the best trees for poles, timber and ropes/fibre for housing construction as well as the best grass species for thatching & fodder.

In the same vein, women are better placed in terms of accessing and controlling local knowledge on factors directly linked to household food security. The colonial-induced systems of assigning crops to each gender as women's and men's crops is another factor with bearing on gendered knowledge. Subsistence crops, especially those with small seeds such as cow-peas and millet, are usually regarded as women's crops while men control cash-crops and grains (Mascarenhas & Mbilinyi, 1983). Therefore, with respect to household food security women's knowledge systems tend to be more broad-based in comparison with men.
The gender 'roles' stereo-typing has yet other social implications to indigenous and local knowledge systems. For one thing, participation in such roles create associated needs and interests particular to each gender but which are not necessarily similar. These have to be met by the ecosystem with the use of local knowledge. Yet, it is pointed out elsewhere that women's interests, knowledge and priorities are neither consulted nor are they considered as important inclusions in most development programmes aimed at managing agro-biodiversity (Mascarenhas and Mbilinyi, 1983; Koda & Mukangara, 1997).

This does not mean however that indigenous knowledge under men's command is always considered and used during the planning and implementation of all development programmes. There has been a growing tendency for instance, for most development planners and policy-makers to marginalize both indigenous and local knowledge systems during planning and policy-making at micro and macro levels.

(b) Marginalization of local knowledge systems in formal knowledge structures

The bias against local knowledge in Tanzania has its own history. It originates from the interaction with European and Arabic culture which introduced both formal education and new religions in Tanzanian communities. The manner in which formal education was introduced and used local communities to a great extent facilitated gross marginalization of local knowledge systems. Formal education, which tended to reflect European culture, attempted to replace local knowledge as reflected in the curriculum (content) of such education and its pedagogical methods. It was generally assumed for instance that local people were less knowledgeable than the white colonial personnel. The colonial masters, and to some extent the African students, seldom acknowledged the existence of some groups of black (African) people who had more knowledge than the white people.

Moreover, most of the traditional structures for packaging' and dissemination of local knowledge were demolished while attempts to replace them have been futile. Formal media for instance has been monetized and urbanized and even where traditional knowledge is promoted, the tendency has been for its content to be commercialized and hence the decreased accessibility for the majority of non-affording users. Also, where indigenous knowledge systems managed to survive, the tendency has been to consider them as backward/primitive even where alternative knowledge systems were inaccessible or inappropriate. A good example is medicinal knowledge which was highly marginalized (after the introduction of the so- called "modern" health systems i.e. hospitals/ dispensaries, formally trained doctors, etc. Only recently have formal institutions such as the Institute of Traditional Medicine been established in the country to give traditional medicine some prominence respect and to study the inherent benefits as well as generating information for a broader spectrum of users. Indeed, an increasing use of traditional medicine and associated institutions has also been noted after the adoption of the Structural Adjustment Programmes which introduced on cost-sharing in the social services sector (Nyamuhanga, 1997).

Despite government efforts to distribute essential drugs to dispensaries for community members, demand has always surpassed supply. In many cases non traditional healers are also recognized and given space in the government initiatives to eradicate diseases (their NGOs are registered like any other NGO and their works are being promoted to the general public). The increasing use of "Neem" tree (Muarobaini) as a cure for malaria for instance has been noted in recent years as a coping strategy but more so as an alternative to the use of malaria drugs.

The colonial system and Christianity have played different roles in marginalizing local knowledge systems. The value systems instilled in the elite group for instance and which advocated that "new"/imported things are always superior to old/traditional/local products and that indigenous religions and associated knowledge systems and institutions (initiation ceremonies, traditional dancing & singing and traditional healing processes/ procedures/ medicine) were bad or un-Godly, primitive have all been quite damaging to the promotion of local knowledge. The processes inherited by the postcolonial governments, has contributed to marginalize and seemingly threaten local knowledge.

Marginalization of women's local knowledge is also linked to the general inferior position afforded to women in many ethnic groups. Despite their more frequent visits to the forests to collect vegetables,
firewood, mushrooms, fruits and other food items and hence their high level of knowledge on this subject matter, women's knowledge was and is still conspicuously ignored, even by social science researchers, in terms of dissemination and use for development purposes. Yet women's key role in agro-biodiversity management and their holistic understanding of agro-biodiversity and issues of food security need to be well researched, in order to understand the complex nature of indigenous/local knowledge systems and their potential effectiveness in addressing broader issues of food security.

Power relations and management of agro-biodiversity

It is worth noting that issues of indigenous/local knowledge systems and gender are within the realm of power relations, especially at the public level. A good example is the competition existing between local maize seeds some of which are more drought and pest resistant and hybrid seeds promoted by big agro-business companies such as "Cargil" which are threatening farmers' self-reliant farming systems (Mbilinyi, 1997). While farmers are finding it increasingly difficult to afford the price of hybrid seeds and accessories such as fertilizers and pesticides, their local seeds are disappearing at the same time and at an alarming speed.

Power relations as embedded in local knowledge systems are broad-based as they encompass different levels beyond the household. At the village level, where members from several clans are residing, differential patterns of controlling knowledge are evident, although, the gender differential is still the major pattern. Apart from the differential ownership and control of resources along class and ethnic lines which determine the type of activities one is engaged in, and hence the form of accessed knowledge system, there are knowledge systems which are inherited along clan lines as pointed out in section 1.2 (e) above. These include knowledge on specific procedures/principles for healing certain diseases (secretive knowledge) as well as knowledge on the science of rainmaking. It also applies to knowledge on production of local technologies where only certain clans are well versed in, usually through inheritance. The "iron-smithery" clans such as the "Washana" of Pare ethnic group from Same and Mwanga districts in the northern part of Tanzania are a case in point where such skills were "discretionary" and hence not public. Other discretionary knowledge systems include medicinal knowledge where an apprentice chosen by the traditional doctor/ herbalist, to carry the "medicinal bag" ("mkoba wa mganga" in Swahili) is likely to gain the relevant knowledge from the traditional healers partly through observation but more so through "initiation" into the medical field.

Issues on power relations are even more pronounced at both national and global levels as state policies and legal frameworks protect big agri-business and pharmaceutical companies and allow them the opportunity to research, produce and distribute crop and livestock seeds, pesticides, insecticides and human and veterinary medicine as well as power to control the seed banks (including "livestock seeds" banks) at the expense of local knowledge systems and farmers' self-reliance. Issues of "intellectual property" rights, "patents" and "trade marks" over local knowledge also depict power imbalances as local knowledge providers and managers of agro-biodiversity are increasingly being robbed of the opportunity to establish small income-earning enterprises through the use of local knowledge. These rights are usually acquired by the "well-placed" (influential) and rich companies who are quicker in buying the "patents" before the grassroots people are aware of the legal implications. Yet such patented knowledge originates from the latter through research and botanical prospecting.

Incidentally, even the knowledge on intellectual property rights is unevenly distributed in Tanzania as well as between developed and less developed countries. This is largely to the advantage of advanced countries. Undoubtedly, local knowledge and skills exist and could be exploited for production of commodities, both medicinal and consumables. Knowledge on certain purplish fruits which provide palatable juice which is used for treatment of anaemia cases, wild roots known as "mdudu" in Pare language which produce energy-rich liquid after pounding the roots (used during food shortages) and a powder-like product known as "kimpa cha ibwe" (in Pare language) used by the local people as anti-poison medicine could easily be used to produce industrial products albeit at small scale basis. Yet, the political will to motivate local people to engage in such enterprising activities (on the part of policy makers) seems to be lacking. To a large extent also these processes are not advocated for, neither by researchers nor the donor community.
Power sharing is an essential component of democracy and transformation dynamics. However, contemporary democratic processes initiated globally, Tanzania inclusive, have not yet addressed issues on power sharing of indigenous/local knowledge nor have they adequately challenged the gendered hierarchy associated with both gender-roles stereotyping and knowledge systems. Women are believed to have acquired very unique knowledge on agro-biodiversity management as a result of their role in food production, child & health care, vegetable and firewood collection, etc. Yet most of them have no decision-making powers over productive resources (land, trees, etc.,) and no say on what to grow on land even where they are more knowledgeable on the best habitat for crop/tree species to be grown on such land (Mascarenhas & Mbilinyi, 1983; Koda & Mukangara, 1997). The unequal power relations which gives men more prominence in socioeconomic and cultural systems are largely maintained both locally and globally amidst the well applauded democratic processes witnessed in Tanzania and elsewhere to-date. The issue of power relations, especially on property rights and security over resources which leads to employment opportunities, adequate incomes and food security, are therefore pertinent in the management of agro-biodiversity and should thus be reflected in contemporary research programmes.

To be able to address all these challenges, however, one has to have a clear gendered vision, mission and commitment to realize such ideals. National political structures, national research institutions and individual researchers are still grappling with these issues as shall be discussed in part two below.

2 RESEARCH AGENDA FOR THE PROJECT ON GENDER, AGRO-BIODIVERSITY AND LOCAL KNOWLEDGE SYSTEMS

2.1 Introduction

It is contended in this chapter that issues related to gender, agro-biodiversity and indigenous knowledge systems are both complex and dynamically linked to each other. Partly this complexity has forced most rural development researchers information seekers as well as advocates of food security to shy away from seriously articulating the relationship between these three variables in their research. Besides, there are very specific underlying factors that have rendered the task of collecting, managing and disseminating information on gender, biodiversity and indigenous/local knowledge systems a difficult venture. The following discussion is an attempt to highlight the dynamism embedded in these factors especially with respect to issues of methodology and communication.

2.2 Approaches used by institutions/individuals

Several approaches have been used to record and disseminate information on gender, agro-biodiversity and indigenous/local knowledge systems. Gathering information on food security is a challenge to researchers not only in terms of broadening the interpretation and understanding of rural development dynamics but also in terms of developing appropriate methodologies for accessing, analysing and disseminating information on such issues. Invariably, this challenge is to be articulated within the areas of choice of the needed information, sampling of information providers, methods of documenting and recording the acquired information, choice of targeted users of such information and the media of communication.

Understanding research and communication challenges

Research is an essential tool for understanding development dynamics and as a component of the communication sector, it gives opportunity for raising issues of content, domestication, packaging, reproducing and transmitting information (both qualitative and quantitative) on such dynamics. Media choice and language are added components of the communication sector which are a means of reaching targeted groups during research and information dissemination, hence their importance in the research process.

Communication on the other hand is normally a two-way process involving different stake-holders and ensuring accessibility and control of accurate and appropriate information for development purposes. In
the case of research, communication plays the role of channelling information on both the research agenda and the research findings. Gaviria (1999:3) points out that:

“Communication for development efforts start by listening to what people already know, what they aspire to become, what they perceive as possible and desirable and that which they can sustain.”

Inherent in this type of communication is the challenge to create an environment for acknowledging the need to listen to the voices of different stakeholders in order to tap adequate information for addressing development issues. There are other pertinent issues related to research processes that are worth discussing. These include choice of the research theme/topic geographical location (coverage), methodological issues, analysis of gathered information, storage and dissemination of information as discussed below.

**Coverage**

The word "coverage" as used in research activities is multi-dimensional. On the one hand it connotes both issues addressed (research themes/topics) as well as sampled stakeholders/information suppliers in terms of age, gender, class, ethnicity and even race. It also implies geographical coverage in a country or region.

(a) **Choice of research themes**

There is a need to redress the balance. It is rare for researchers to respond to the information needs of grassroots people, largely because the research agenda is drawn without their input. Researchers normally choose research themes/topics which are of interest to them as individuals and/or as representatives of research institutions or to donors and financiers.

(b) **Geographical coverage**

In a country like Tanzania where diverse geographical features are evident, geographical coverage becomes a concern, especially when a national picture is expected to emerge from a single research activity. Survey methods which allow for a bigger geographical coverage are seldom used. The most common approach has been the use of case studies, either purposefully or randomly selected. There has been a tendency to marginalize some regions, districts and villages due to factors such as poor infrastructure (transport, radio wave reception, telephones, etc.), logistics (comfortable accommodation, commonality of language used by research partners, availability of interpreters, etc), location preference by the sponsors of the study, adequate time and financial resources and interest in geographical area of study by the research team. There is also the general tendency for donors to sponsor research activities in areas where there are already some projects sponsored by the same donor, a bias which is also influenced by the quality of infrastructure.

The least popular regions for mainland Tanzania (with varying degree of popularity) include Mbeya, Tabora, Kigoma, Rukwa and Ruvuma. As for the districts, the ones which have received more attention include Singida rural, Same, Simanjiro, Ngorongoro, Monduli, Muheza, Kibaha and a few in Mtwara and Lindi regions (Koda, 1999). Even in the so-called "well researched" districts, very little research on agro-biodiversity management has been done and not in the holistic and gender-desegregated manner as expected by the LinKS project.

(c) **Who supplies the information: Gender specificities**

Another area of concern, is the choice of suppliers of information (information providers) who are interviewed or chosen. Recognizing gender as a useful variable in research requires sensitivity to the differences in women and men roles, needs, aspirations, experiences, status and position of women and men from different age, wealth status and ethnic groups. One needs to be exposed to both knowledge on gender concerns/gaps and differences and skills in gender analysis either through experience or by formal sensitization and training initiatives before she/he can seriously attend to the gender variable in research. The baseline study mentioned above has revealed that most researchers/managers of research
institutions are gender-insensitive as reflected in both the content and methodology of implementing their research agenda.

Gender blindness is usually reflected both in who supplies the information and in the type of information collected/recorded and documented. Yet concerns on choice of research partners are broader than the question of gender sensitivity. Because providers of local knowledge and managers of agro-biodiversity are broad-based in terms of gender, age, class, ethnicity and professional orientation. The choice of who participates in the research process should reflect a concern to represent input from all the stake-holders and all socioeconomic groups. Such an analysis could only be done by researchers who advocate for "real" partnership in research.

**Methods and research tools**

The choice of methodologies used for data/information collection also influences the quality and quantity of the dated or information. There is no single methodology that can capture all the needed information on development issues. However, some methods deliver better gendered results. The marginalized status of local knowledge systems and gender issues in formal research processes has hampered the development of appropriate methods for capturing information on gendered local knowledge. Contemporary research methods are often extractive and essentially predetermined. Researchers generally use research questions that are outside the realm of the value system of the community from which that knowledge is obtained. Hence their inadequacy in capturing gendered local knowledge. The shortfalls of the extractive research methods also include failure to acknowledge the power dynamics involved in local knowledge systems as influenced by age, gender, class, ethnicity and race.

The anthropological approaches which have the ability to capture local values and related conceptual frameworks is as marginalized in today's research processes as local knowledge itself. Even where this approach is applied, it has to use several tools for data collection. It is encouraging that in the recent past, local knowledge systems have attracted a good number of researchers for various reasons, including the failure of some development initiatives to achieve the intended goals through marginalization of local peoples' participation. With the increasing acknowledgement of grassroots-oriented development thinking, research methodologies capable of facilitating peoples' involvement both as respondents and as research partners are being developed. Participatory Rural Appraisals (PRAS) is one of the methods aimed at people's involvement/participation in research and development processes.

Tanzania has been a late adopter of PRA methods. PRA focuses on the use of local symbols, categories, materials, concepts, and classifications in gathering information and in linking information sharing with analysis and planning of development activities. The use of PRA methods enhances peoples' confidence (Van Vlaenderen, 1999; Swantz, M-L, 1984). There are few PRA methods which are very suitable for collecting information on local knowledge systems and are therefore worth mentioning. These include mapping, diagramming and video making where data is visualized and analyzed at the same time. Commenting on these methods, Van Vlanderen (1999:6) contends that:

"The diagram is drawn as a reflection of the knowledge of the people who draw it and simultaneously provides an anchor for the explication of further knowledge ... as the diagram enfolds the visual nature of it helps participants to further access and analyze aspects of their knowledge that are more tacit ... The enfolding diagram enables individual participants' thinking and memory and stimulates them to add to what others have already provided. Diagrams have an added advantage in the dissemination stage where both literate and semi-literate participants can access the intended information"

It is also a truism that existing PRA processes are little documented. For the few institutions such as IRA, TFNC, ERB, SUA and OXFAM/IDS, which managed to collect information on at least two of the three key variables embedded in the LinKS project (e.g. on gender and agro-biodiversity), the use of PRA methods was very instrumental in ensuring collection of adequate and appropriate gendered information. The use of video production and popular theatre both as research tools and a dissemination media has
attracted very few users such as the Mtawa based (RIPS) Media Centre (RIPS Media Facility). Yet the issue of copy right of both the video and the knowledge disseminated through the video remains a challenge to be addressed by both the researchers and extension workers who continually advocate for sharing of local knowledge but are less articulate on the issue of intellectual property rights. Advocating for artistic methods of data collection, Gaviria (1999:3) contends that:

Beyond listening, communication for development requires participation from local artists and media specialists in preparing and testing messages for each specific audience ... It requires efforts to enable local people to document and share their own knowledge so that they become partners able to articulate their perspectives.

The use of PRA (research) tools calls for training/capacity building since not all research institutions/individuals are well versed in such specialized skills. PRA tools also call for team work as well as proper sampling to ensure they recognize of the diversity among population of suppliers of information.

Information dissemination/communication issues

Issues of communication cut across media and language choice. Information has to be packaged, stored and disseminated. This has implications for the choice of language and format in which such information is packaged and stored. Mechanism need to be put in place to make stored information easily accessible in terms of affordability, reachability and readability, hence the issue of media choice.

(a) Language and media

In Tanzania, although Swahili is widely used both in urban and most rural communities and used even in research, it is seldom used for information dissemination. Out of more than 70 references on Tanzania assessed in April-May 1999 on issues of gender, local knowledge systems and agro-biodiversity, only one was written in Swahili. The rest were in English. Any information is "no information" if needs and interests of targeted clusters of cannot understand.

The choice of what of media to use is also pertinent not only during information collection but also during dissemination of such information. As previously highlighted, rural people use songs, riddles, stories, proverbs, and other verbal media to pass on their knowledge. Information sharing with information providers is not only a matter of basic democratic rights but also a component of the research process. Yet, this is seldom done. This assumption belittles the importance of both intra- and inter-community dialogue emanating from the research process, which as noted earlier contributes to raising peoples' confidence in their ability to manage agro-biodiversity and ensure household food security.

Unfortunately, traditional media such as theatre, songs and plays which women and men more so for old women are to communicate (Koda & Ngaiza, 1991) are over-shadowed by electronic and print media which is more popular among the elite and urban-based groups.

(b) Electronic media

Dissemination of information on issues related to biodiversity, gender and indigenous knowledge systems is also done through the radio which is more accessible to semi-illiterate people. However, the predominance of English language as the medium of communication, the complex form of the documented information, the uncoordinated manner in which such information is disseminated to the rural-based communities and the poor system of distribution of--print and electronic media due to the underdeveloped communication system especially in reaching remote villages are additional stumbling blocks. Women's lack of control over cash income also limit their control over use of family-owned radios (Koda & Mukangara 1997).

Packaging and storage of information
Most institutions and individual researchers, record the information from their research initiatives mainly in print media in the form of articles in journals and newsletters, chapters in published books, bibliographies, printed indexes, booklets, pamphlets, magazines, reports, newspapers. Others store information in tapes and computers. All institutions visited during April- May (1999) baseline study have documentation rooms of varying capacity and sophistication both in terms of number of documents stored, storage format and numbers of employees and related support systems. For the University of Dar es Salaam there is an attempt to have a collection of materials on biodiversity on an electronic database. There was concern on the failure of researchers to feed information to the relevant libraries for inclusion in the databases and collections. As a result reports on Tanzania are more easily located in Europe than in Tanzania itself.

Much of the information generated by Tanzanians on Tanzania is seldom found in international journals because most Tanzanian authors do not have a tradition to publish in international journals. As for local publications, the area is still grey since the publishing sector is still very rudimentary. Few institutions such as the University of Dar es Salaam have started their own journals, usually with the donor support and with this comes the attendant danger of continuity. Some manage to survive for a longer time while others die after producing only a couple of issues. A few positive initiatives also exist for joint publications between local institutions or authors and external partners. Accessibility of some of these publications can also be arduous because only a limited numbers have been printed overseas, the distribution is erratic and it is not rare to find only a single copy available in the whole of Tanzania.

The quality of institution based documentation centers is mixed. For the documentation centers are user-unfriendly in that very little professional input has been invested in them. For almost all these centers and even libraries, donor support has been very instrumental in putting them in their present shape. Th University of Dar es Salaam Library and the Botany Department benefited from FAO support. Documentation centres or communication initiatives which receive support to distribute such publications freely or where the price is heavily subsidized have done well. These include:

- The WRDP newsletter called "Mwenzangu" which is a quarterly Swahili publication targeted to both rural and urban communities,
- The TGNP newsletter known as "Ulingo wa Jinsia" which contains articles on gender issues both in Swahili and English languages,
- TAMWA's magazine called "Sauti ya Siti" which reports on various socioeconomic and political issues with a gender focus and which is in both Swahili and English
- Others include "Mazingira Yetu" and "Misitu" published by DONET. Although these publications contain little information on gender, biodiversity and indigenous knowledge systems, they are potential distributors of such information.

Addressing communication hurdles

Attempts to address information dissemination hurdles include the use of PRA methods, action-oriented research and animation methods where acquired information is continuously shared by the research partners during the data collection process. The use of workshops, seminars, meetings, round-table discussions, and other fora where information is shared/discussed, analyzed and internalized for development purposes is another fast means of information sharing. Nevertheless, most research budgets do not cater for dissemination fora despite their high value.

It is also true that some people are good at attending workshops/seminars but are less efficient in utilizing knowledge and skills gained from such fora. Worse still, most workshop/seminar organizers do not have a follow-up mechanism to assess the impact of these fora on intended development concerns. A challenge is therefore posed for the workshop organizers to ensure that such workshops become an in-built component of a research/development activity.

2.3 Partnership in generating and disseminating relevant information.
Information gathered from the few institutions which were visited, from individuals interviewed during
the survey and from secondary sources point to the fact that although very little information exists on the
linkages between gender, biodiversity and indigenous knowledge systems, a good number of
individuals/institutions are interested in these issues (See Box 5).

Box 5. Institutions Interested In LinKS Agenda

**Donors and international organisations:**
- FINNIDA/RIPS
- DANIDA
- NORAD
- Oxfam
- SIDA/SAREC
- UN organs such as FAO, UNEP, UNICEF, UNESCO and UNDP

**Research/Government institutions:**
- Sokoine University of Agriculture (SUA),
- University of Dar es Salaam (especially IRA, IDS, ERB, Library, Department of Botany & Department of
  Zoology),
- Institute of Traditional Medicine based at the Muhimbili University College of Health Sciences (MUCHS),
- Tanzania Food and Nutrition Center (TFNC),
- Ministry of Agriculture and Cooperatives
- Ministry of Natural Resources and Tourism
- National Environmental Council (NEMC).

**NGOs:**
Women's Research and Documentation Programme (WRDP), University of Dar es Salaam Tanzania Gender
Networking Programme (TGNP),
Journalist Environmental Association of Tanzania (JET),
Tanzania Women Leaders in Agriculture and Environment (TAWLAE), TAWOSTE

**Ethical and practical implications**

Invariably, most of these partners' activities are embedded in the mission statements, as verified by the
case of NEMC. It is envisaged that collaboration with these institutions will ensure coverage of issues of
research, training and documentation/dissemination of the relevant information for various uses
including awareness creation, policy design, technical support and conservation of flora and fauna.

A fear haunts some researchers as to whether the grassroots people would willingly supply information
on indigenous/local knowledge systems. One way of addressing such a fear is to ensure that research is
gear towards addressing peoples needs and that local peoples' contribution is given its due recognition
and people's rights and knowledge are protected. There is a tendency however for local knowledge to be "captured" from grassroots people, and transformed to global knowledge without acknowledging the
original owners (pirating on/and commercialization of indigenous knowledge). Hence the immediate
need to address legal aspects of patenting local knowledge and intellectual property rights.

A particular need related to local knowledge is the "value adding" to such knowledge for income
 generation. Payment for information given/shared, as is done in formal institutions where publications
are sold and instructors/information givers are paid, "value adding” is a general challenge on how local
knowledge givers can benefit from their accumulated knowledge on agro-biodiversity. Examples are
found elsewhere in Africa where local knowledge givers have benefited in several ways after their
knowledge was applied in pharmaceutical industries. The case of preparation of the preparation of “aloe”
juice for pharmaceutical purposes supports this contention (Van Vlaenderen, 1999).
Much more needs to be done to help the processes to be started in Tanzanian rural communities to enhance small scale businesses through application of local knowledge system by identifying available skills and facilities and where necessary upgrading them for this purpose. Other needs of local knowledge providers include legal protection to their right to control their knowledge systems especially where such systems are integrated into the commercial world as an effort to apply available knowledge for greater developmental utility and for income earning to alleviate poverty.

In Tanzania where the pharmaceutical industry is at an embryonic stage, local knowledge providers are not aware of the dangers of non-discretional sharing of local knowledge. The researchers who are relatively more aware of commercial use of such information are also equally slow in questioning the current knowledge dissemination practices which do not raise issues related to "intellectual property rights" to accreditable local knowledge providers. Indeed this is one of the grey areas which should form part of the future research agenda and challenges for the LinKS project.

Collaboration with CBOs, and NGOs is another useful strategy for winning the support and confidence of information givers. It is also argued by most researchers that there are "silent"/informal ways of getting grassroots people to support and share knowledge. This can be achieved by learning by observation, having an inquisitive mind, acknowledging that some groups have more knowledge than others, knowing these groups and talking to their members are just a few hints on how a confident researcher can generate useful knowledge from rural partners.

2.4 Knowledge gaps, areas for further research and the partnership challenge.

Knowledge gaps

Although there are several institutions interested and involved in agro-biodiversity (see Box 5), nevertheless there are many knowledge gaps. Local knowledge on varieties of both plant s and animal species is closely related to issues of gender. To be able to determine knowledge gaps and consequently issues for further research, it is necessary to thoroughly assess available information through probing on the following issues/questions:

(a) Who are the local keepers/managers of biodiversity
(b) What do women and men know about positive practices and local technologies related to sustainable use and management of agro-biodiversity
(c) What influence women and men's ability to manage agro-biodiversity'
(d) What were the traditional mechanisms used in the past for collecting, packaging and disseminating local knowledge for addressing issues of food security.

From the information gathered from the April-May baseline study suffices to make some preliminary opinions, a modest assessment of the 'content' of knowledge gaps:

(i) Research done on agro-biodiversity components

Plant species

Information gathered from baseline study shows that more research has been done on varieties of plant (including seaweeds) than on animal species. This is partly explained by the fact that a substantial number of projects have been initiated on source of energy, exploitation of forest products, knowledge on vegetables, and fruits, general issues on environment including soil conservation, and the traditional medicine sector. As far as the linkage between energy sources/ forestry activities and indigenous knowledge systems is concerned, at least 35 studies conducted in Tanzania were assessed during the baseline study (Box 6).

Box 6. Examples of studies on local knowledge in Tanzania

- Traditional methods of preserving local vegetables and fruits (TFNC, MCDWAC, UDSM etc)
- Local technologies in production, processing, utilization and marketing of crops and vegetables (TFNC, TAWLAE, UDSM)
• Indigenous soil conservation practices (UDSM, SUA)
• Traditional/Local structures for food storage facilities and methods of food preservation (TFNC, TAWLAE, UDSM).
• Traditional techniques for preparation of weaning foods (Kimea) (TFNC)
• Traditional diets (including togwa) and nutrients' content (TFNC)
• Level of Community awareness on biodiversity values (TFNC, UDSM, SUA, ME&T MOA&C, Several NGOs, etc.)
• Indigenous knowledge on tree and shrub species and their use (UDSM, SUA, NGOs)
• Knowledge on local indigenous trees and herbs useful for medicinal use (ITM, NGOs, MoE&T, etc)
• List of plants used by traditional healers (REPOA, UDSM, ITM, etc)
• List of fauna and flora resources and implication on environmental and related policies (individual researchers etc.)
• Issues of access and dependence on forest and tree products in relation to household food security (UDSM, MONR&T, NGOs, SUA, etc.)
• Forest products as source of firewood and medicine (MoNR&T, SUA, UDSM, NGOs, etc)
• Impact of forest activities on food security and identification of plant species (wild fruits and vegetables in tropical countries including Tanzania) (MoA&C, NGOs, UDSM, etc)
• Deforestation and impact on household food security and agro-forestry initiatives (MoNR&T, NGOs, UDSM, SUA etc.)

Most of the information gathered on the above-mentioned aspects is basically gender insensitive except for very few cases which will be highlighted shortly. Most of these studies were case-studies, hence the small geographical coverage. The University of Dar es Salaam (especially the department of Botany), TPRI and the Institute of Traditional Medicine have done various scientific researches on agro-biodiversity with bias on botanical characteristics, an area which is very useful for addressing the "value-added" component of local knowledge systems.

Animal Species
Information on the relationship between animal species and local knowledge systems is scanty These are mainly concerned with issues on:

• Small animal stock keeping
• Indigenous/local knowledge on shrubs and tree species for veterinary purposes.

As with plant species, very little was said on the gender aspect. Besides, the geographical coverage was even more limited and was almost confined to pastoralist communities. At the above mentioned workshops in June 1999, participants expressed their concern on this marginality, which is said to have drastic effects on the livestock sector. Therefore, a number of recommendations to this effect were proposed as highlighted in section 0 below

(ii) Research on the gender dimension of agro-biodiversity
This is one of the areas that received minimal attention in previous research activities. Information from the baseline study mentioned above shows that less than ten references were more articulate on the linkage between gender and local knowledge systems. See Box 7 for more details.

Box 7. The gender dimension of agro-biodiversity and local knowledge systems
Some of the areas covered, aspects highlighted, and conclusions made in research activities in Tanzania include:

• Appreciation of women as main care-takers of agro-biodiversity
• Differing needs of women and men with respect to agro-biodiversity as influenced by gender roles stereotyping
• Gendered roles in gathering of wild animals, fruits, leafy vegetables and wild foods.
• Issues on women and men's roles/workload
• Women empowerment in relation to forest and environmental activities
Conclusions proposed in studies conducted so far on gender, biodiversity and indigenous knowledge systems include:

- That most forest products directly related to household food security (collection of wild vegetables and fruits) are collected by women while those associated to cash earning are a "man's domain"
- That most foresters (forest professionals) are men (Koda 1994, Koda & Mukangara, 1997) and that most forest programmes are organized and managed by men even where women provide the bulk of the labour force e.g. in tree planting activities
- That women are the main custodians of agro-biodiversity
- That the type of training offered in schools and the value systems promoted there-in tend to downgrade the importance of women's local knowledge. A good example is knowledge on "intercropping" and "transplanting" which tends to be more practised by women but which was considered unprofessional in the teaching of agricultural sciences in Tanzania in the past. It is only recently that this agro-related science is being re-introduced to farmers (personal interviews with agricultural experts in May, 1999).

Another often cited example is the use of local knowledge for food preservation such as banana drying and preservation, whose marginalization has resulted into abandonment of banana preservation as a coping strategy for food security. Consequently, huge loses of bananas and hence food insecurity has been noted amidst abundant harvests. This reiterates the fact that policy makers, planners and educationists marginalize women's local knowledge systems during decision-making on development issues.

Much efforts were made to articulate these issues in relation to gender, agro-biodiversity and local knowledge systems, the connections between the three variables as portrayed by contemporary researchers still leaves a lot to be desired. The main focus on gender issues for instance was in relation to women's role in the collection of wild vegetables and food processing/preservation and storage. But even here very few case studies were cited to validate the implied connection between women's knowledge systems and agro-biodiversity.

There are also other pertinent areas with respect to local knowledge systems which are yet to be addressed. Little is known for instance on the level of security over control of property such as land, natural forests and other natural resources which women and men use to perform their gender-based roles in agro-biodiversity management. More information is also needed on the dynamics involved in addressing women and men's conflicting interests arising from the gender roles stereotyping as it relates to agro-biodiversity management and household food security. This has to be juxtaposed with issues of copyrights, patents, intellectual property rights and the policy framework for protection of providers of local knowledge systems. This therefore calls for evaluation of both the policy and legal frameworks put in place in Tanzania on issues of gender, agro-biodiversity and local knowledge systems, an area which is beyond the scope of this report.

Areas for further research

Based on the literature review, there is no doubt that very few studies on gendered information on the issue of agro-biodiversity and local knowledge systems in Tanzania. Qualitative data from interviews held with individuals from institutions visited during the baseline study and the input from the two June
workshops point to several limitations which have either caused or aggravated the noted gendered information gap. These include:

(i) Little conceptual knowledge and analytical skills on gender and more so on the symbiotic relationship between gender, agro-biodiversity and local knowledge systems. This situation is aggravated by the fact that most researchers pay little attention to the multi-disciplinary nature of research on agro-biodiversity management and food security. Most professional disciplines which are "inward" rather than "outward" looking in that experts in each discipline such as botany, zoology, chemistry, economics and sociology work on their own without involving research partners (such as gender specialists). This imbalance could be addressed by forming multi-disciplinary research teams such as the case of the research project implemented at the University of Dar es Salaam etc. In the Rural Food Security project based at IDS economists, political scientists, sociologists and educationists have teamed to work together.

(ii) The general lack of awareness among researchers on how to articulate the gender dimension of their research themes. This gender-insensitivity is partly attributable to cultural values promoted in both informal and formal socialization processes. Women and their knowledge systems are accorded inferior position in society. Since indigenous/local knowledge systems as a whole were considered inferior by the formal schooling curriculum, women's knowledge systems suffered double marginalization. During the 1970s for instance, research on women's knowledge systems was considered non-academic/non-professional even by social science faculties at the University of Dar es Salaam.

(iii) Limited policy framework for dissemination of indigenous knowledge systems in schools and colleges. There is a need for guidelines on the contents/syllabi for subjects taught in schools.

(iv) A general lack of workable institutional policies on dissemination/sharing of research findings and information collected from consultancy work (absence of a sound and implementable library policy). Indeed, there is a regulation which obliges researchers to deposit copies of their research/consultancy reports in public libraries but like many other laws, there is little enforcement. There is need to revisit and streamline this law in relation to the manner in which consultancy/research reports on local knowledge systems should be disseminated with emphasis on the concern on intellectual property rights.

(v) There are very few NGOs/CBOs dealing with gender and biodiversity issues. Both NGOs and CBOs are addressing issue on gender, agro-biodiversity and local knowledge systems in a very limited manner. (See Box 8).

(vi) Most research institutions allocate very small budgets for research Activities. There is inadequate capacity in terms of funds, material resources (computers, office-space etc.) and researchers and policy makers are ill-equipped with gender analytical knowledge and skills for assessing local knowledge and agro-biodiversity issues.

**Box 8. Research on Gender Issues at the University of Dar es Salaam**

There are at least six research groups addressing gender issues in research at UDSM. These include TAWOSTE, IDSWSG, WRDP, MEWATA, TRHG, WED and SWAAT. However, although the main focus of their research is gender analysis, their concentration has been confined to the generally mainstreamed subjects such as politics, economics, health, education, agriculture, and environment but not in local knowledge systems per se. Invariably, focus on local knowledge systems and biodiversity is still missing in their research and analytical work and this also applies to the work of other NGOs such as JET, TAWLAE, TAWLA, TAMWA and TGNP. Failure to address the multiplicity of gender issues in local knowledge systems and biodiversity is not just a matter of lack of research funds but rather a function of limited conceptual framework on the inter-relationships involved as well as the needed push/motivation, to adopt such a framework in their research activities. Introducing a specific project on gender, agro-biodiversity and local knowledge systems would definitely stimulate such an interest/motivation.
As noted in the definition of local knowledge systems existence of a democratic dissemination mechanism and media is a major factor in sharing information on agro-biodiversity management and concerns on food security. Implicit in this report are three types of groups targeted for information dissemination.

(a) **Individual Partners:** These need to know both the research agenda and the research findings. Accessing the generated information either for further re-packaging to ensure wider dissemination or for immediate use in planning their development interventions is a felt need by this target group.

(b) **Advocacy level** (groups) where available information could be repackaged, disseminated and used for advocacy on rights, policy changes and legal reforms on agro-biodiversity management and food security.

(c) **Mass level** where there are more consumers of information and where challenges for developing alternative media (popular media) need to be stimulated and addressed. Advocacy on issues of property rights/copy rights on local knowledge systems could also

**Specific Areas for Further Research**

Several heads of institutions interviewed during the baseline study mentioned earlier, that the area of gender, agro-biodiversity and indigenous knowledge systems in its perceived connectedness, as highlighted in the project document, is not only new but also calls for a well grounded conceptual framework. The need for more research and analysis on issues of gender, biodiversity and indigenous knowledge systems is therefore widely acknowledged by the research community, policy makers, advocates of food security and human rights and experts on rural development and environmental issues. A national picture can emerge by broadening the analysis, showing symbiotic linkages between the three issues of concern as well as expanding the geographical coverage. At the workshop held in Morogoro, a number of specific areas were considered important for further research (see Box 9).

### Box 9. Areas for further research: Recommendations from workshop in Morogoro, 22-23 June 1999

- Analysis of socioeconomic and political factors which have led to erosion and/or marginalization of local knowledge systems and their institutions;
- Impact of AIDS on local knowledge systems;
- Impact of Structural Adjustment Programmes on local knowledge systems;
- The erosion of traditional social systems (community socialization of children and youth, respect to old people, traditional structures/institutions/media for knowledge dissemination) and impact on local knowledge systems.
- Modalities for “adding value” to local knowledge for entrepreneurship development (commodity production)
- packaging and re-packaging local knowledge for use in production of pharmaceutical drinks and other commodities, etc.
- market assessments for such commodities
- Review and assess existing policies and laws with respect to property rights on issues on local knowledge systems.
- Different power relations between local knowledge systems and the so-called modern knowledge systems.
- Household based and gendered power relations over local knowledge systems.

These are just few examples of research areas which could be addressed together with areas already started e.g. on livestock, agricultural promotion and environmental protection and management.
2.5 Proposed mechanism for sharing existing information and literature on gender, agro-biodiversity and local knowledge systems

Existing mechanisms for dissemination of information on gender, agro-biodiversity and indigenous knowledge systems are not only underdeveloped but are also largely user-unfriendly. As yet, there is no serious attempt to systematize the collection and storage of reports, papers, publications and other forms of records on this subject matter. Of course, occasional and ad hocly organized workshops/meetings, round-table discussions and electronic media announcements have been organized as useful dissemination strategies but their impact has been minimal due to small coverage in terms of content and audience.

Sharing information especially with grassroots people is even more curtailed by the issue of language used in packaged materials. The use of Swahili and even local (ethnic) languages is a necessary factor for information dissemination to non-English speakers who are the majority in Tanzania. As noted earlier also, the use of PRA research methods and the traditional media is acknowledged as a mechanism for information sharing, but which is still very much underutilized. Currently the liberalized publishing business has to a limited extent helped matters.

A new mechanism for sharing of information on gendered local knowledge systems is therefore needed to address these and related limitations. The task in setting up this mechanism is however simplified by opportunities offered by available/advanced information technology, the use of which is gaining popularity among research institutions, government ministries and the NOO community. This includes the use of e-mails and Internet. An added advantage is the increasing acknowledgement by both researchers and the donor community (as verified by the LinKS project) of the key role played by local knowledge systems in agro-biodiversity management and rural development. Nevertheless, communities need to be motivated and assured of gainful returns so as to win their active participation and commitment in sharing their local knowledge with other development partners. Box 10 gives an idea of the range of activities that could be carried out.

### Box 10. Some Important Activities For Sharing Information

The following activities are proposed:

- Develop training packages on the linkage between gender, agro-biodiversity and local knowledge systems for different target groups highlighted in this report.
- Initiating training/sensitization programmes on gender, agro-biodiversity and local knowledge systems.
- Establish a central data bank/unit on institutions, individuals, networks and materials on local knowledge systems, agro-biodiversity and gender.
- Initiate a national & sustainable journal/publication on gender, agro-biodiversity and local knowledge systems.
- Advocating for laws/policies on protection of rights of givers/bearers/managers of local knowledge systems.
- Establishing a national network on gender, biodiversity and local knowledge systems (probably through the LinKS project).
- Preparing/Publishing & disseminating an annotated bibliography (with national and regional coverage) on gender, agro-biodiversity and local knowledge systems (probably under the LinKS project).
- Promotion of small scale (local-based) pharmaceutical and related enterprises with the aim of "adding value" to local knowledge and providing incomes to appropriate knowledge providers. This calls for initiation of pilot projects addressing issues of development of appropriate technologies with farmers for the same purpose, joint priority setting with the government and farmers and actual production of commodities at rural-based snwil scale level. To some extent also this would act as an incentive for more sharing of local knowledge systems.
- Publicize existing laws/conventions on local knowledge systems (if any) and intellectual property rights.
- Lobbying and advocating for establishment of by-laws at local level on biodiversity management.
- Propagating for the use of traditional media (stories, songs, riddles, etc) in disseminating information on local knowledge systems.
- Enhancing/strengthening existing information dissemination channels/networks.
3 CONCLUSION

Previous sections of this report have shown that information gathering and dissemination and hence networking on issues of gender, agro-biodiversity and indigenous knowledge systems has tended to be limited in Tanzania. Few attempts made to articulate the relationship between these three variables have also been inadequate both in terms of content (addressing the pertinent issues involved) and the geographical coverage, despite an increasing number of interested partners. Limited knowledge and analytical skills in articulating and problematizing inherent relationships between these three variables is considered a major stumbling block. Little appreciation of the important role played by both local knowledge systems and gender analysis in planning and policy designing has also been noted as a factor which made this venture even more difficult.

The challenge to come up with a research agenda and related approach which ensures adequate linkages between gender, agro-biodiversity and local knowledge systems therefore need to be addressed. This will not only promote local knowledge systems but also assist in creating a new perspective to agro-biodiversity management.
POLICY ASPECTS AND INSTITUTIONS FOR GENDER-BIODIVERSITY LINKAGES IN TANZANIA

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1 INTRODUCTION

This is an analytical study of the policy environment in Tanzania for the LinKS project. The work was commissioned by FAO to establish the context for the LinKS project in Tanzania (see ANNEX 2), including an analysis of:

- the policy environment in Tanzania in support of gender, agro-biodiversity and indigenous knowledge systems, and
- the key institutions in Tanzania working with policies related to rural men and women’s knowledge about sustainable use and management of agricultural biodiversity for food security.

The study consisted mainly of literature review and an institutional survey. It also drew substantial information from a field visit to village communities and on two workshops; one being the Draft Review Workshop held on June 7th, 1999, and the other being the First National Workshop on Gender, Biodiversity and Local Knowledge Systems (LinKS) to Strengthen Agricultural and Rural Development held on June 22nd and 23rd, 1999.

1.1 Literature Review

The literature review exercise initially focused on documents on policy, program and projects concerning food security with the view to identifying relevant policies. The latter was accomplished by framing issues concerning food security, and then identifying relevant policy areas. In each case, the relevant policy was subsequently identified as the one(s) with mandate to respond to the issues/policy area in question. To this was added the policies concerning gender, biodiversity, and indigenous knowledge. ANNEX 4 presents the matrix of issues, policies, and institutions identified through this exercise. The literature review also aimed to determine the level of policy implementation, whether there were any difficulties in implementation; and also to determine the nature and level of treatment that the relevant policies accorded to gender, biodiversity, indigenous knowledge, food security, and community involvement.

To cover the international dimension, international agreements and conventions that Tanzania is party to, and that were relevant to food security, gender, agro-biodiversity and IKS were identified. An evaluation was then carried out to determine the extent to which guidelines from these conventions were being incorporated into Tanzania’s policy/legislative framework.

As the institutional survey got underway, the focus of the exercise shifted towards institutions and their capacities to develop policies and implement activities concerning gender, agro-biodiversity, and indigenous knowledge as they related to food security.

1.2 Institutional Survey and Field Visit

Apart from yielding new information, the institutional survey served to verify information obtained through literature review on institutions, and policy implementation program/measures. The survey was conducted largely through personal interviews based on a questionnaire. The actual course of interview however varied considerably from one institution to another, depending on the nature of the institution,
person in-charge, and the relevant activities in which the institution was engaged. On several occasions information obtained from one source conflicted or differed considerably with information on the same subject from another source.

The consultant twice visited villages in Kigamboni in January 1999 and met with grassroots women and discussed issues concerning development. The consultant had hoped to develop with the women a project proposal for funding. The information gained from these visits provided a very good frame of reference for the consultant in assessing institutional capabilities for policy implementation for matters concerning rural development, as well as issues concerning women and gender.

1.3 Limitations

The study was designed to be a desk review with fieldwork limited to a survey of institutions based in Dar es Salaam. As a result of this, some information of importance at a local level might have been missed, especially on the interface between the Central Government and the Local Governments (Regional and District level) concerning policy implementation and supervision by the Central Government.

Seeking information about policies and national programs required that the consultant approach policy makers and chief executives for the information. As many of them were away around this time or busy attending pre-budget meetings, the exercise took much longer than had been planned and, as such it might have affected the amount and quality of information obtained.

ANNEX 3 provides definitions of key terms and concepts used in this study.

2 THE CONTEXT OF GENDER, BIODIVERSITY AND LOCAL KNOWLEDGE IN TANZANIA

2.1 Its significance

Gender, biodiversity, and indigenous knowledge systems are very essential in agricultural development, food security and other important development activities. This is now commonly accepted in international fora and literature, and the three variables are universally acknowledged to be of particular importance in developing countries. Unfortunately in Tanzania, the linkages between gender, biodiversity, IK and food security, are not very well understood, appreciated, nor acknowledged; and are therefore not very well articulated into policies.

The linkages between gender, biodiversity, IK and food security in Tanzania derives from the fact that the bulk of agricultural production is done by rural small-holder farmers. Small-holder agriculture is the mainstay of the national economy and food security. Moreover, farmers in rural Tanzania, like in other developing countries, tend to do everything by gender because they are tribal in organization and guided by tradition and custom. Consequently, gender determines access, ownership and control of resources, as well as entitlement to benefits accruing to management of these resources.

Also the socio-economic circumstances in Tanzania make gender, biodiversity and indigenous knowledge of special relevance in food security and rural development. It is an agrarian nation, with agriculture contributing 61% of the country’s GDP, 50% of the country’s population being below the poverty line of T. Shs. 73,877 (1995) per annum; 54% of the economically active population in rural areas are women. About 98% of these women are engaged in agriculture, producing about 60%-80% of all domestic supplies and cash crops, and shouldering most of domestic work (URT, 1998, NPES).

Tanzania has over 40% of its land set aside for purposes of biodiversity conservation in the form of wildlife protected areas and forest reserves (Kaiza-Boshe and Kamara, 1995). Although land set aside for biodiversity is physically and effectively withdrawn from farmland, protected biodiversity is very essential to agricultural production because protected biodiversity provides a genetic reservoir for agricultural development, as well as protecting the environment for agricultural sustainability. Protected
organisms in some cases provide an additional source of food and, in fact, in times of famine, wild plants and animals provide a crucial source of emergency food.

Like all other socio-economic attributes in rural areas, indigenous knowledge is gendered, and culturally variable. The knowledge held by men is different from that held by women; and knowledge obtaining in one community is different from that held by another.

Women form the largest part of the workforce in agriculture, and are thus the major custodian of knowledge pertaining to farming and food security. However because of gender, these women do not own, nor control the agricultural resources and the benefits accruing to their management; their rights to agricultural resources are thus limited to usufruct privileges, and consequently are left out of development programs. They are generally not consulted on development matters even though they play crucial roles in pertinent activities. As a result of this systematic gender discrimination, development policies, and the various respective implementation instruments and activities miss women’s knowledge and skills. Women, in turn, miss out on empowerment, crucial development information and technology and the social economic benefits. The result of all this is relatively low productivity, worsening poverty and increasing food insecurity.

Thus any initiative aimed at improving or ensuring food security or rural development in Tanzania cannot succeed without taking into account the linkages between gender, biodiversity, indigenous knowledge, and food security. The FAO project Gender, Biodiversity and Local Knowledge Systems (LinKS) to Strengthen Agricultural and Rural Development (GCP/RAF/338/NOR), otherwise known as the LinKS project, seeks to address these linkages as they relate to food security.

2.2 The policy environment

The project seeks to increase the understanding of gendered IK among the major players in ensuring food security, and strengthen the capacity of key policy implementing institutions to carry out the requisite changes. It also seeks to overcome the barriers to local management, conservation and sustainable use of biodiversity. For this to happen, there must be a conducive policy framework, and it is to ensure this requirement is met or addressed that FAO commissioned this study. It was also necessary to assess the capacity of the key implementing institutions to carry out respective activities, and levels of implementation attained. Generally, in Tanzania, policy implementing organs are line ministries and departments.

The policy environment for any subject matter is defined by the policy framework, the relevant policies and the level of treatment they accord to relevant issues, and respective policy implementation mechanisms and status.

Policies come in different forms. First, there are umbrella policies such as the Constitution (State Policy) and the Ruling Party Policy (presently CCM Policy) which aim at covering or defining the boundaries of all others. Secondly, there are framework policies that provide guidelines for the formulation of specific sector or cross-sectoral activities. Thirdly, there are sectoral policies that are formulated for express purpose of guiding specific sectors. Fourthly, there are cross-sectoral policies, being those that cut across a number of sectors.

In addition, there are instruments that are issued as strategies, declarations, manifestos, or pronouncements, and that are subsequently institutionalized, albeit without undergoing formal formulation process, but which are nevertheless policies in their effect. International agreements and conventions that have been acceded to or ratified but are yet to have implementation mechanisms in place may also be regarded as policies.

Policy implementation instruments include action plans and strategies, laws, by-laws, regulations and rules. Laws are divided into two categories, domestic laws and international laws. While domestic laws are those originating in the country, for the purpose of this work, international laws include all legal instruments originating from outside Tanzania.
It is against this background that the analysis of the findings on the policy environment and institutional capabilities has been done. It starts with the policies and the levels of treatment they accord the issues under review, which is followed by sections on implementation of policies, implementing institutions and international agreements. Finally are conclusions and recommendations.

3 POLICY TREATMENT OF GENDER, AGRO-BIODIVERSITY, INDIGENOUS KNOWLEDGE, AND FOOD SECURITY

3.1 Overview

The policy environment for any subject matter is determined by established national policy framework, relevant policies and the level of treatment they accord relevant issues, and respective policy implementation mechanisms. In Tanzania, for any activity area of concern, the policy environment is determined by the Constitution (State Policy), the Ruling Party Policy, the National Policy Framework, the relevant sector and cross-sectoral policies and their implementation mechanisms. To this may be added international agreements that have been acceded to or ratified but have yet to have respective implementation instruments installed. Additionally, when the Development Vision 2025 and the National Poverty Eradication Strategy (NPES) come into effect, they will both have a bearing on the policy environment.

The issues under review are gender, biodiversity, indigenous knowledge, food security and community involvement. Community involvement was added for its importance in determining the amenability of individual policies to implementation in the decentralized government administration environment.

The current National Policy Framework Paper is one for the three years lasting from 1998/99 to 2000/01. The relevant sectoral and cross-sectoral policies include policies identified through framing of issues concerning food security (see ANNEX 4), and policies concerning the issues under review. (Table 1).

The list of all policies and the relative levels of treatment they accord to issues under review is presented by Table 2. The policies and the respective implementation activities are presented in ANNEX 5.

Table 1. Relevant Sectoral and Cross-sectoral Policies

| 1. Agriculture and Livestock (Mainland) | 11. The National Forest |
| 2. Agriculture, Livestock and Natural Resources (Zanzibar) | 12. The Wildlife Policy of Tanzania |
| 5. National Environmental (Zanzibar) | 15. Local Government Reform |
| 6. Lands (Mainland) | 16. Community Development |
| 7. National Land Use Plan (Zanzibar) | 17. Science and Technology |
| 9. Gender | 19. Macro-economics |
| 10. Food and Nutrition | 20. Biotechnology |

Examination of level of treatment of the issues under review by individual policies and their implementation mechanisms yielded the results described below under respective policies.

3.2 The Constitution (State Policy)

While the State Policy as stipulated in the Constitution (1998) makes no specific mention of indigenous knowledge, nor food security, it was considered adequate because it accorded an appropriate general treatment to matters concerning gender, biodiversity and community participation.
3.3 Ruling Party (CCM) Policy

The CCM Policy treatment of issues under review was more elaborate on women and community participation. While treatment of biodiversity conservation appeared to be adequate, that of IKS was marginal, and distinctly in favour of modern technology and farming systems.

3.4 The National Policy Framework

Examination of the National Policy Framework Paper for 1998/99 - 2000/01 revealed that there were no specific framework policy on IK, and no specific policies on gender. Gender was only implied whenever differences were deemed to exist between men and women over an issue in question. The macro policy framework reflected the WID approach. (See Box 11 below and ANNEX 6).

<table>
<thead>
<tr>
<th>Box 11. The Concept of WID</th>
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<tr>
<td>The Concept of Women in Development in Tanzania is described as a process of empowering women so as to realize their potential. This is considered to entail the following:</td>
</tr>
<tr>
<td>(i) Recognizing their potentials in the society.</td>
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<tr>
<td>(ii) Recognizing their ability to make decisions which affect their lives.</td>
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<tr>
<td>(iii) Utilizing the resources and produce of their labour.</td>
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<tr>
<td>(iv) Having the ability to acquire, utilize and promote science and technology which will reduce and ease their daily work load.</td>
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Macro policies for agro-biodiversity conservation and management were for the most part published under environment and agriculture. In both cases, studies were underway to identify strategies for improved sector performance in changed government administration, macro-economic policies, and the consequent structural adjustments. Other framework guidance on matters concerning agro-biodiversity management and conservation was provided under the natural resources sector (forestry, fisheries and wildlife).

Framework policy guidance on food security was provided under agriculture, and it was accorded high priority treatment. However, no other framework policy area provided guidance on food security.

3.5 Development Vision 2025

Vision 2025 accorded gender, food security and community participation high priority treatment. It however scored very low on biodiversity conservation and IK.

3.6 The National Poverty Eradication Strategy (NPES)

The National Poverty Eradication Strategy accorded high treatment to all the five issues under review. Perhaps of major importance is the fact that NPES provided for the Ministry responsible for planning to incorporate poverty eradication consideration into national planning guidelines, and develop macro-policies that would be consistent with the poverty eradication initiatives and facilitate the implementation of those policies. This means when the NPES comes into effect it would enable the incorporation of the issues under review into policies.

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9 High treatment for gender by Vision 2025: Gender equality is mentioned as one of the major goals as, gender equality and the empowerment of women in all socio-economic and political relations and cultures
3.7 Sectoral Policies

Respective policies, including related and cross sectoral, are those promulgated for express purpose of providing guidance on matters concerning the issues under review. Whereas related sectoral policies refer to policies that were primarily instituted to provide guidance on other issues, but have a bearing on the issue(s) under review. Cross-sectoral policies are those that are not instituted for any particular sector, as they are relevant to several sectors, and are published as such in the current national plan and budget document, viz. The Rolling Plan and Forward Budget for Tanzania for the Period 1996/97-1998/99 (URT, 1996. As mentioned earlier, a list of relevant sectoral policies is presented in Table 1.

A review of policy documents and consultation with policy makers and chief executives with regard to coverage and level of treatment accorded to issues under review yielded the results presented in Table 2. Below is the summary of the findings of the exercise.

Gender

The draft Gender Development Policy was being reviewed by the Cabinet Secretariat. However, the recently passed Land and Village Acts had very significant implications on matters concerning gender in the country, not only on land related matters, but also on matters concerning gender equity and advocacy in general. Apart from putting women at par with men on land matters, incorporating gender equity provisions in the two laws was a landmark achievement for the gender advocates, activists, and civil society. This has set a very significant precedence for matters of advocacy for gender equity and other rights. The civil society, especially NGOs, now know that it is possible to claim and secure even the seemingly more difficult rights and, more importantly; they know how.

Agro-biodiversity

Policy guidance on biodiversity conservation and management was included in the National Agricultural Policy and the National Environmental Policy. Additional guidance was provided by sub-sector policies on natural resources. These included the Forestry Policy, the Wildlife Policy of Tanzania, and the National Fisheries Sector Policy and Strategy Statement.

Indigenous knowledge

There was no specific policy on IK. The problem was that IK did not receive adequate treatment in the entire policy framework. Briefly, five of the reviewed policies accorded IK a high treatment, and another gave it an adequate treatment, the rest of the policies gave it either implicit treatment or did not mention it altogether.

Food Security

Food security was accorded high treatment by the National Agricultural Policy, the Food and Nutrition Policy, and the National Poverty Eradication Strategy. Whereas policies for Local Government Reform and Community Development accorded it an implicit treatment, at best.
<table>
<thead>
<tr>
<th>Name of policy</th>
<th>Consideration for gender</th>
<th>Provision for Biodiversity Conservation</th>
<th>Acknowledgement of IKS Value</th>
<th>Measures for Food Security</th>
<th>Community involvement</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM Policy</td>
<td>adequate</td>
<td>adequate</td>
<td>marginal, high on modern farming systems</td>
<td>no mention</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>The Constitution (State Policy)</td>
<td>adequate*</td>
<td>adequate</td>
<td>no mention</td>
<td>no mention</td>
<td>adequate</td>
<td>* awaiting gender policy and it is mainstreamed</td>
</tr>
<tr>
<td>The Tanzania Development Vision 2025</td>
<td>high</td>
<td>no mention</td>
<td>implicit</td>
<td>high</td>
<td>high</td>
<td>Policy still in draft</td>
</tr>
<tr>
<td>Agriculture and Livestock</td>
<td>adequate</td>
<td>adequate</td>
<td>high</td>
<td>high</td>
<td>adequate</td>
<td></td>
</tr>
<tr>
<td>Food and Nutrition</td>
<td>implicit</td>
<td>implicit</td>
<td>implicit</td>
<td>high</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Women in Development</td>
<td>high</td>
<td>no mention</td>
<td>no mention</td>
<td>no mention</td>
<td>no mention</td>
<td></td>
</tr>
<tr>
<td>Co-operative Development</td>
<td>WID approach</td>
<td>adequate</td>
<td>no mention</td>
<td>no mention</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Environmental (Tanzania Mainland)</td>
<td>WID High Gender implied</td>
<td>high</td>
<td>implicit</td>
<td>high</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>National Environmental (Zanzibar)</td>
<td>WID approach</td>
<td>high</td>
<td>implicit</td>
<td>no mention</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Gender Development</td>
<td>high</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>in draft, treatment of gender assumed</td>
</tr>
<tr>
<td>Poverty Eradication Strategy</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>High</td>
<td>in preparation</td>
</tr>
<tr>
<td>Fisheries</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>implicit</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Biodiversity Conservation Strategy</td>
<td>---</td>
<td>high</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>Not assessed -still in draft</td>
</tr>
<tr>
<td>Lands (Mainland)</td>
<td>WID high Gender implied</td>
<td>adequate</td>
<td>no mention</td>
<td>no mention</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Wildlife</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>adequate</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>National Land Use Plan (ZAN)</td>
<td>no mention</td>
<td>high</td>
<td>no mention</td>
<td>implicit</td>
<td>adequate</td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td>implicit</td>
<td>high</td>
<td>high</td>
<td>adequate</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Science and Technology</td>
<td>WID approach</td>
<td>high</td>
<td>implicit</td>
<td>high</td>
<td>no mention</td>
<td></td>
</tr>
<tr>
<td>Community Development</td>
<td>mentioned</td>
<td>implicit</td>
<td>implicit</td>
<td>implicit</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Macro (National Framework)</td>
<td>no mention</td>
<td>high</td>
<td>no mention</td>
<td>high</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Biotechnology</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>in preparation</td>
</tr>
</tbody>
</table>

**Key:**

**High:** listed as objective and followed by specific policy statement and strategy for implementation.

**Implicit:** Issue under review implied without explicit mention

**Adequate:** Makes reference to issue without elaboration, but enough to warrant distinct implementation measures

**No Mention:** Nothing in the text seem to relate to the issue under review

**Mention:** Mentioned but not a substantive policy statement, nor with implementation measure

---in draft, not published
3.8 General Observations

Apart from what is presented above for individual issues there are four general observations that could be made about the relevant policies. These are:

First, the most outstanding revelation of the matrix (Table 2) was that, with the exception of the National Poverty Eradication Strategy, the Wildlife Policy and the National Agriculture and Livestock Policy for the Mainland, the relevant sectoral policies were not fully integrative of the issues under review. For a policy to be considered fully integrative of the issues under review, it had to give all five issues adequate or better treatment.

Second, sectoral policies were low in acknowledging the value of indigenous knowledge. Perhaps the most deleterious aspect of this was that the key sector policies in community mobilization, the Local Government Reform and Community Development policies did not even mention IK.

Third, since most sectoral policies were high on community involvement, it means that if policies were well conceived and implemented, the value of IK in biodiversity management for food security would most likely be realized and tapped.

Fourth, the fact that both Vision 2025 and NPES were integrative of four and five of the issues under review, respectively, presented an important opportunity for redressing the weaknesses and closing the gaps in the policy environment. This is because the two were mandated to prescribe policy matters to the Planning Commission, which in turn had a mandate to formulate macro policies (thus providing policy framework) and ensure consistency between the macro and sectoral policies.

4 IMPLEMENTATION OF POLICIES

Given the policy framework, success in addressing issues related to gendered knowledge on sustainable use and management of biodiversity for food security and agriculture in general, would very much depend on implementation of community involvement aspects of the policies. This would in turn depend on status of implementation of the policies and the capacity of implementing institutions to carry out the necessary activities. Success would also depend on the treatment the policy for community development would accord the relevant issues, and the ability of MCDWAC to install implementation mechanisms and supervise their implementation.

4.1 Status of Policy Implementation

The summary of development and implementation status of relevant policies (ANNEX 5) reveals three important elements. First, that the majority of policies were issued in or after 1997, and therefore their formulation took into account the imperatives of decentralization. Perhaps this explains their high score on providing for community involvement. Secondly, most of these policies had no implementation instruments; the highest step reached in many cases being formulation of the action plans or implementation strategies. Thirdly, only a few policies were backed by recent legislation. These included the Cooperative Development Act, the Crop Protection Act, RALG Act., the Land Act and the Village Act.

As a result policy implementation for matters relating to gendered IK in the management of agro-biodiversity for food security is dependent on some five pieces of legislation that are up-to-date and the ability of the concerned institutions to provide implementation oversight. Therefore one of the short term measures should be to improve the capacity of the concerned institutions of MoAC, MRALG, and the Ministry of Lands, and their Zanzibar counterpart institutions to supervise the enforcement of the laws.

In the medium and long term, however, success of implementation of activities concerning gendered IK in conservation and management of biodiversity for food security will depend on the government capacity to review and enact laws to enable legally binding implementation of the policies.
4.2 Laws

The importance of laws in enabling effective implementation of policies was demonstrated by the case of the Food Security Department (FSD) as explained in section 4.7 below. Laws are necessary instruments in enabling the implementation of policies (including international agreements and conventions), for without being backed by laws, policies are of little consequence to management activities as they are not legally binding. For effective implementation of policies, therefore, it is imperative that laws are enacted to enable legally binding policy implementation.

Laws must also provide adequate mandate for the requisite activities, as well as providing for the necessary resources for carrying out the activities. Once the laws are in place, they should be reviewed from time to time to keep up with the changes in macro and related policies or laws. While failure to provide necessary mandate is certain to render the implementing institutions ineffective, failure to review the laws to accommodate changes in other policies/legislation renders the law obsolete or conflicting with other policies/laws, and thus make their enforcement impossible.

Indeed much of the Government’s failure to ensure food security is attributable to the inadequacy and obsolescence of the law that governs the operations of the Food Security Department. The Food Security Act is inadequate in providing the mandate for the FSD to take full charge of and co-ordinate the major elements of food security. In fact it did not provide for much beyond the establishment and management of the Strategic Grain Reserve (SGR). Also the Act did not provide for allocation of the necessary resources for the Department to carry out functions beyond maintenance of the SGR.\(^{10}\) Moreover, the Act has not been reviewed to take into account changes in the agricultural produce market systems deriving from macro-economic and Local Governments reforms (URT, 1997).

Presently the government’s capacity to formulate laws is highly dependent on external support for funding and technical assistance. Thus installation of policy implementation mechanisms /instruments for policies that are attractive to donors will proceed at faster pace than those that are not. Policies that are not attractive to donors may never have implementation instruments installed. In fact, failing of initiative to take off due to not being attractive to donors has been cited as one of the reasons why the Comprehensive Program for Food Security, the formulation of which was funded by FAO, never took off the ground.

4.3 Co-ordination

This study further revealed that even when legally binding implementation mechanisms are in place, institutions may still fail to carry out necessary action for lack of functioning and effective co-ordination mechanism. Indeed co-ordination problems have impeded locally originated initiatives concerning food security as well as those originating from outside the country. A good example of local initiative that has suffered from co-ordination problems is the establishment of the National Household Food Security Consultative Group (NHFSCG). Chaired by MoAC (Food Security Department) and TFNC serving as its Secretariat, the Group had drawn membership from all stakeholder categories; including SUA, NGOs, FAO, the private sector, Planning Commission and MCDWAC. In spite of a good plan and the representativeness of the members of the Group, it had remained inactive; and while TFNC seemed to be fully aware of the Group’s composition and functions, the Food Security Department (the Chair of the Group) seemed to be vaguely aware of the Group’s activities.

Indeed the FSD did not seem to be aware, nor have the mandate and capability to know about food security activities that were being carried out by other players in the country, even though it was the major Government organ with the legal mandate to co-ordinate food security matters. The Department was aware of this shortcoming and was looking for funding to enable it to carry out a survey of food security activities in the country.

\(^{10}\) Presently the major substantive functions of the Department are: (i) to monitor the food situation in the country and to make recommendations to the Government on any measures to be taken, (ii) to manage the SGR, and (iii) to estimate food crop production on an annual basis.
However, useful as it might be, the output of the survey would not solve the capacity problems that were being experienced by the FSD. This is because the mismatch between what was expected of the FSD and what it was actually capable of rendering was not due to lack of information. The mismatch was largely attributable to the weaknesses in the Act from which it drew its mandate for its activity and allocation of resources.

Lack of co-ordination mechanism had also been the major impediment in implementing international conventions and agreements that Tanzania was party to, as was amply illustrated by the faltering follow-up action on the World Food Summit of 1996. Tanzania participated in the World Food summit and signed the Rome Declaration on World Food Security in November 1996. In signing the declaration, Tanzania committed herself to implementing the World Food Security Plan of Action (WFSPA). In the same month, FAO prepared a draft strategy for National Agricultural Development Horizon 2010 as a follow-up action on the World Food Summit. Until June 1999 the Government had no national plan of action for the implementation of WFSPA. It was only then that MoAC was planning on consulting with the PC on how to go about it.

On the other hand, a local NGO, the Tanzania Association of Home Economics (TAHEA), had been trying since January 1997 to co-ordinate some follow-up action on the WFSPA without much success. This included sensitization workshops, popularization of the WFSPA, and setting up a follow-up committee comprising of representatives of NGOs and a member from MoAC. In carrying out these activities, TAHEA had hoped its efforts would have complemented those of MoAC, or attracted its support, but this had not happened yet. For its earlier activities TAHEA had been supported by COOPIBO and the World Bank, and it presently had no supporter, nor pledge for the purpose. Consequently, WFSPA follow-up activities had been suspended until another supporter came along.

4.4 Institutions: How They Stood

A survey of Ministries and their sub-sector institutions concerned with implementation of policies on rural men and women’s knowledge on sustainable use and management of biodiversity for food security and agriculture revealed that very little was done in this field. The most positive feature, however, was that they were all planning on, working on, or otherwise reviewing action plans for the implementation of their respective policies. However it was not clear when the plans would be implemented because, with the exception of the Division of Environment and the Forestry and Bee-keeping Division (FBD) which had already secured funding pledges for their immediate activities, all other institutions needed funds to take their next steps. Table 3 presents the institutions and the steps they were taking and/or needs for further steps in supporting community based natural resources management.

Apart from the WD, FBD, and DF which were substantively supporting community based natural resources management, all other institutions were only supporting community based natural resources management through technical support as per their policy mandates and capabilities. Most of them had policies and/or staff but very little, if any activity on the ground.

Also, while the FD, the WD, and MoAC, seemed to recognize the value of IK for natural resources management for food security and/or sustainable use of agro-biodiversity, other institutions did not seem to be aware. It was apparent that for the institutions that were supporting community based natural resources management there was need for greater awareness and sensitivity about IK. On the other hand, all institutions that were substantively involved in community based natural resources management needed substantial financial as well as technical assistance to move from pilot projects to countrywide programs or projects.

Table 3. Steps Reached In Policy Implementation To Support Community Based Natural Resources For Food Security

<table>
<thead>
<tr>
<th>Name of Institution</th>
<th>Current Steps/Needs</th>
<th>Support to Community Based Natural Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. MoAC (FSD) | Seeking assistance for various activities (MoAC); Seeking financial assistance for food security activities survey (FSD) | Extension service (MoAC)
2. RALG | Multi stakeholder forum in place to deal with linkages and support | Through mandate to ensure comm. participation in all development issues concerning community
3. MCDWAC | Funds need to complete the NFCDP | Technical support in community mobilization
4. VPO | More funds needed for the institutional options and legal framework study | Providing policy and technical guidance on environmental concerns & use of natural resources
5. FBD | Funds for Action Plan pledged by FINNIDA | Providing technical support to community forestry activities
6. Division of Wildlife | Funds needed for action plan | - Managing of community conservation pilots
7. Fisheries Division | Funds for management plan needed | - Providing technical support to establish & manage Wildlife Management Areas
8. TFNC | Funds required to review action plan | NA
9. National Land Use Planning Commission | Proposal ready, seeking funds for large scale participatory village land use mgmt. for years 2000-2002 | mobilizing resources and facilitating participatory village land use planning and management
10. Division of Environment (in VPO) | -Formulation of Biodiversity Conservation Strategy fully funded
    -Program to combat desertification is funded
    -Funding for reviewing NEAP pledged | Provision of policy and technical guidance on environmental/natural resources protection
11. Ministry of Education and Culture | Funds needed for the master plans for major activities being prepared | Presently none

In order to work with rural communities more effectively all institutions, NGOs, CBOs etc. who were presently supporting community natural resources management also needed to work with the technical Ministry concerned with community mobilization (MCDWAC) and the Ministry concerned with administration of community development matters (MRALG).

On the other hand, for MCDWAC to play its role more effectively in assisting other players to work with communities on matters concerning using IK, the following four items were required. First, financial assistance to enable the Ministry to complete the formulation of its National Framework for Community Development Program (NFCDP). Second, technical and financial assistance for Districts to translate the NFCDP into District Community Development Programs that are tailored to local situations. Third, conscientization of Community Development Officers about the value of gendered IK in natural resources management for food security and sustainable use of agro-biodiversity. Fourth, sensitization of other sectors, the Local Governments, and other players on the need to employ the services of Community Development Officers in all their activities at community level.

4.5  International Agreements

In addition to the legal/regulatory instruments and institutional framework derived from national policies, there were several regulatory instruments that were relevant for this study which originated from international fora and agreements to which Tanzania was signatory. These included conventions, treaties, protocols, and international programs of actions.

Tanzania had signed a good number of relevant international instruments, and ratified/acceded to several of them (see table 4). In signing some of these instruments, it appears, the Government had done so in the belief that implementing them would not require rigorous or very costly processes to provide legal effect to the agreements. The practice had thus been for Tanzania to sign the agreements soon after they became open for signatures, and take several years to ratify them. The process of instituting implementation instruments had also been tardy.
However, for international agreements and conventions to have effect on the issues under review, they have to be incorporated into national law, which is usually a lengthy and costly process. Tanzania is a Common Law country, and as such, to have a force of law, the treaty or convention so ratified has to be translated into a national law by instituting a new law or modifying an existing one to conform to the provisions of the convention/treaty so ratified (Makaramba, 1997). This requires technical as well as financial resources; requirements that Tanzania was ill-placed to fulfil, and hence the major reason why Tanzania has been very slow in ratifying international regulatory instruments, in spite of a good record in signing the instruments.

Experience with international conventions such as the Beijing Platform of Action, the Convention on Biological Diversity, and the International Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa shows that, when resources are available (almost invariably from some external donor), the process of instituting implementation instruments proceeds fairly quickly.

Other setbacks in implementing international legal instruments included highly inadequate manpower and technical capacity, and absence of well-defined institutional framework capable of mobilizing broad stakeholder participation in the ratification and law formulation processes. Because of these setbacks, Tanzania had in some cases failed to ratify and domesticate international conventions/treaties even when the technical and financial resources had been availed by the convention’s/treaty’s supervisory authority.

In some instances, domesticated international instruments could not be enforced by target institutions, or the people at large, due to conflicts between the international laws and local law especially customary and religious laws. For instance, it was not possible to adopt CEDAW wholesale due to certain provisions conflicting with some customary and religious laws. There were also conflicts between conventions that Tanzania had ratified such as the CBD and the Patent Law (1987) on providing for protection of biotechnology. While the CBD provided for regulation and protection of technology involving all organisms and their parts, the Patent Law excluded plant or animal varieties or essentially biological processes for production of plants or animals other than micro-biological and products of such processes (the Patents Act of 1987).

This was very unfortunate, because, for Tanzania, international agreements and conventions constituted an important opportunity for installation of policy and regulatory/legal instruments for gender and IK sensitive biodiversity management and conservation practices relating to food security. This is particularly so because, as seen from the foregoing sections, Tanzania’s national policy/legal instruments were not sufficiently sensitive to gender and IK to support, regulate, and protect gendered IK in biodiversity management and conservation for food security.
<table>
<thead>
<tr>
<th>Instrument</th>
<th>Date adopted</th>
<th>Status of implementation in Tz. (include dates)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventions On Environment And Natural Resources</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conv. on Int’l Trade in Endangered Species of Wild Fauna and Flora (CITES)</td>
<td>1973</td>
<td>Ratified Nov. 29, 1979</td>
<td></td>
</tr>
<tr>
<td>Bamako Conv. on the Ban of the Import into Africa and the Control of Trans-boundary movement and magt of hazardous wastes in Africa</td>
<td>1991</td>
<td>Ratified on April 7, 1993</td>
<td></td>
</tr>
<tr>
<td>Vienna Convention for the protection of the Ozone layer</td>
<td>1985</td>
<td>Acceded on April 7, 1993</td>
<td></td>
</tr>
<tr>
<td>Montreal Protocol on Sub-stances that Deplete the Ozone Layer (Incl. the London Amendment of 1990)</td>
<td>1987</td>
<td>Acceded April 16, 1993</td>
<td></td>
</tr>
<tr>
<td>Agenda 21 (UNCED)</td>
<td>1992</td>
<td>Ratification not required</td>
<td>National Agenda 21 launched March 1993</td>
</tr>
<tr>
<td>The Basel Convention on Control of Trans-boundary Movements of Hazardous Wastes and their Disposal</td>
<td>1989</td>
<td>April 7th,1993</td>
<td></td>
</tr>
<tr>
<td><strong>Conventions On Rights</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The UN Declaration on Human Rights</td>
<td>1948</td>
<td>No ratification needed</td>
<td></td>
</tr>
<tr>
<td>Declaration on the Rights of Indigenous People- Draft</td>
<td></td>
<td>Ratification not required</td>
<td></td>
</tr>
<tr>
<td>Int’l Conv. on Civil and Political Rights</td>
<td>Dec. 16, 1996</td>
<td>June 11, 1976</td>
<td></td>
</tr>
<tr>
<td>International Labor Convention 169</td>
<td>June 27, 1989</td>
<td>Not ratified</td>
<td></td>
</tr>
<tr>
<td>Convention Est. WIPO</td>
<td>1967</td>
<td>Dec. 30th, 1983</td>
<td></td>
</tr>
<tr>
<td>Conventions on Cultural Values and Indigenous Knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paris Convention (Industrial Property)</td>
<td>1883</td>
<td>Acceded June 16, 1963</td>
<td></td>
</tr>
<tr>
<td>Berne Convention (Literary Artists)</td>
<td>1886</td>
<td>Acceded July 1994</td>
<td></td>
</tr>
<tr>
<td>The Rome Convention (Performers, etc)</td>
<td>1961</td>
<td>Not ratified*</td>
<td></td>
</tr>
<tr>
<td>Int’l Undertaking on Plant Genetic Resources (IU)</td>
<td></td>
<td>Ratification not required</td>
<td></td>
</tr>
<tr>
<td>Conv. Concerning the Protection of World Cultural Heritage</td>
<td>1972</td>
<td>Nov. 20, 1987</td>
<td></td>
</tr>
</tbody>
</table>

Conventions on Agriculture

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>The Rome Declaration on World Food Security (PA)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmers’ Rights in the Conservation and Use of Plant Genetic Resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global PA for Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture</td>
<td>1996</td>
<td></td>
<td>Ratification not needed</td>
</tr>
</tbody>
</table>

Conventions on Gender and Women

<table>
<thead>
<tr>
<th>The Beijing Platform of Action</th>
<th>1995</th>
<th>Ratification not needed</th>
<th>Women/Gender Advancement Sub-program developed; Gender Policy formulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)</td>
<td>1979</td>
<td>Aug. 20, 1985</td>
<td>Sexual Offence Act; Gender equitable Land Law; Review of Marriage Act</td>
</tr>
<tr>
<td>The Vienna Declaration and Programme of Action</td>
<td>June 1993</td>
<td>Ratification not needed</td>
<td></td>
</tr>
</tbody>
</table>

**Key:**

Int'l - International; Conv.- Convention; Magt. - Management; PA = Plan of Action; Agric. - Agriculture

5 CONCLUSIONS AND RECOMMENDATIONS

From the foregoing, two sets of conclusions and recommendations can be made about the policy environment and the policy institutions. Both are elaborated below.

5.1 The Policy Environment

Conclusions

The findings of the study indicated that the policy environment in Tanzania was marginally conducive to recognizing and appreciating the value of rural men and women’s knowledge on sustainable use and management of agricultural biodiversity for food security. This was due to three main factors: Firstly, many policies were not backed by implementation instruments, especially laws. Secondly, some key laws, including the Food Security Act of 1991, were outdated. Thirdly, the majority of policies were gender blind, and tended to treat gender issues as women issues. This approach tended to attract negative responses or inaction rather than support. Above all, most policies did not recognize IKS in natural resource management and their value in agriculture and food security.

Very few international instruments had been domesticated to the extent of becoming legally enforceable, and therefore the impact of international instruments on the policy/legal environment for the issues under review had remained low in spite of a good record in signing the instruments. Domestication of such International conventions and treaties that recognize IKS in natural resources management and their value in agriculture such as the Convention on Biological Diversity and the Global Plan of Action on Plant Genetic Resources for Food and Agriculture would make considerable impact in the management and conservation of biodiversity for food security.

Gender blindness, ignorance and even negligence of IK value in natural resource management could be redressed once the NPES and Vision 2025 came into effect. These two instruments accorded priority treatment to gender, and had mandates to prescribe policy matters to the Planning Commission (PC). The PC in turn had the mandate to formulate the framework policies and provide guidelines for the formulation of sector policies and ensure consistency between macro and sector policies.

Recommendations

In view of the above, the following actions are recommended to improve policy formulation, content, and implementation mechanisms.

i) Securing and providing resources and assistance to enable the installation of implementation mechanisms for the Gender Policy as soon as it is passed.

ii) Sensitization of the Planning Commission on gender so as to ensure its incorporation into the macro policies and its subsequent mainstreaming into all socio-economic activities. This would need, conducting gender sensitization seminars for PC personnel.

iii) Sensitization of policy makers in relevant sectors and the personnel in the Planning Commission on the value of IK in sustainable biodiversity management and ensuring food security. This is so as to get policy makers install mechanisms to recognize, protect, promote and support the use of IK for the sustainable use and management of biodiversity for food security.

iv) Secure resources for formulation of action plans, and institution and review of relevant laws. Efforts should be made to have the Government allocate a budget for the purpose, to begin with.

v) Facilitation of the establishment of a national policy formulation mechanism that would co-ordinate and ensure broad stakeholder participation in policy formulation.

vi) Review the international conventions ratification process so as to building capacity to mobilize broader stakeholder participation in the process.

vii) Establish the implementation status of all international legal/ regulatory instruments concerning IK use, rights, and protection; farmers’ and related rights; and biodiversity conservation. Subsequently recommend and facilitate the installation of key instruments that are necessary for promoting a policy environment that is more conducive to valuing and supporting men and women’s diverse knowledge on management of agro-biodiversity for food security.
5.2 Institutions

Conclusions

In the absence of specific policy and an institutional “home” for IK as it relates to agro-biodiversity management and food security, the relevant institutions are taken to be the key institutions working with policies related to rural men and women’s knowledge concerning sustainable use and management of agricultural biodiversity for food security. These include institutions implementing policies concerning gender, women, community participation, biodiversity, culture, agriculture and food. Generally these institutions have very little capacity to address issues related to rural men and women’s knowledge on sustainable use and management of biodiversity for food security due to the following:

i) Not having appropriate, adequate and legally binding mandates.
ii) Lack of necessary resources
iii) Lack of coordination among the key players.
iv) Lack of technical capacity.
v) Non-supportive institutional behavior (as opposed to institutional structures).

To strengthen the capacities of these institutions in dealing with IK in agro-biodiversity management for food security, two sets of recommendations are made:

Recommendations

(a) Short and medium term intervention

i) Review the Food Security Act as a matter of urgency so as to accommodate the requirements of the ongoing reforms and the complexity of food security issues, and provide for an efficient Food Security Department. The Act should provide the FSD with the mandate that would up-grade its status, and enable it to co-ordinate national food security matters effectively.

ii) Securing/provision of resources for the MCDWAC to complete and promote the National Framework Community Development Program.

iii) Sensitization of the key players such as the MoAC, the Local Governments, and Ministry of Natural Resources and Tourism on the need to work with CDOs

iv) Conscientization of Community Development Officers (CDOs) about the value of IK in natural resources management and agriculture.

v) Sensitization of Local Councils about the value of IK in natural resources conservation, food security and socio-economic development in general. This could be done in a series of seminars involving CDOs, but this should be done after the CDOs have been conscientized on IK.

(b) Long term interventions

i) Review of the capacity building needs of individual key institutions such as MoAC with respect to the issues under review so as to identifying sustainable interventions. The same should be done for counterpart organizations in Zanzibar.

ii) Securing/provision of financial and technical assistance to key institutions to enable them to install policy implementation mechanisms, especially enacting or reviewing relevant laws. It is assumed that it should be easier to allocate a budget for policy development matters now that the Government’s role has been streamlined, and policy development has become the core function of line ministries.

iii) Review of the institutional framework for ratification of international conventions and treaties with the view to establishing a national capability to ratify international conventions and treaties promptly, competently and through broader stakeholder participatory process.

iv) Securing of resources to support IKS studies and extension work, and the publication of findings in both scholarly and popular publications on permanent basis.

v) Establishing an organ to carry out and/or coordinate research, and serve as a depository for IK literature. This could form part of an existing research or development institution. The establishment of the organ, however, should be preceded by a study to identify the best option for its form, structure, and function.
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## Annexes

### ANNEX 1. ABBREVIATIONS/ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCS</td>
<td>Biodiversity Conservation Strategy</td>
</tr>
<tr>
<td>CCM</td>
<td><em>Chama cha Mapinduzi</em>, name of the Ruling Party, meaning The Revolutionary Party</td>
</tr>
<tr>
<td>CDO</td>
<td>Community Development Officer</td>
</tr>
<tr>
<td>COOPIBO</td>
<td>Belgium-based NGO</td>
</tr>
<tr>
<td>COSTECH</td>
<td>Tanzania Commission for Science and Technology</td>
</tr>
<tr>
<td>DANIDA</td>
<td>Danish International Development Agency</td>
</tr>
<tr>
<td>DONET</td>
<td>Dodoma Region Environmental Network</td>
</tr>
<tr>
<td>ERB</td>
<td>Economic Research Bureau</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>FBD</td>
<td>Forestry and Bee-keeping Division</td>
</tr>
<tr>
<td>FINNIDA</td>
<td>Finnish International Development Agency</td>
</tr>
<tr>
<td>FSD</td>
<td>Food Security Department</td>
</tr>
<tr>
<td>GAD</td>
<td>Gender and Development</td>
</tr>
<tr>
<td>IDS</td>
<td>Institute of Development Studies</td>
</tr>
<tr>
<td>IDSWSG</td>
<td>IDS Women Studies Group</td>
</tr>
<tr>
<td>IKS</td>
<td>Indigenous Knowledge Systems</td>
</tr>
<tr>
<td>ILFEMP</td>
<td>Institutional and Legal Framework for Environment Management Project (Study)</td>
</tr>
<tr>
<td>IRA</td>
<td>Institute of Resource Assessment</td>
</tr>
<tr>
<td>JET</td>
<td>Journalist Environmental Association</td>
</tr>
<tr>
<td>LinKS</td>
<td>A system that uses women and men’s local knowledge for the conservation and utilisation of agro-biodiversity in order to improve food security</td>
</tr>
<tr>
<td>MCDWAC</td>
<td>Ministry of Community Development, Women Affairs and Children</td>
</tr>
<tr>
<td>MJCA</td>
<td>Ministry of Justice and Constitutional Affairs</td>
</tr>
<tr>
<td>MNRT</td>
<td>Ministry of Natural Resources and Tourism</td>
</tr>
<tr>
<td>MoAC</td>
<td>Ministry of Agriculture and Cooperatives</td>
</tr>
<tr>
<td>MoNRT</td>
<td>Ministry of Natural Resources and Tourism</td>
</tr>
<tr>
<td>MUCHS</td>
<td>Muhimbili College of Health Sciences</td>
</tr>
<tr>
<td>NEAP</td>
<td>National Environmental Action Plan</td>
</tr>
<tr>
<td>NEMC</td>
<td>National Environmental Council</td>
</tr>
<tr>
<td>NFCDF</td>
<td>National Framework for Community Development Program</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
</tr>
<tr>
<td>NHFSCG</td>
<td>National Household Food Security Consultant Group</td>
</tr>
<tr>
<td>NORAD</td>
<td>Norwegian Development Agency</td>
</tr>
<tr>
<td>NPES</td>
<td>National Poverty Eradication Strategy</td>
</tr>
<tr>
<td>PC</td>
<td>Planning Commission</td>
</tr>
<tr>
<td>PMO</td>
<td>Prime Minister’s Office</td>
</tr>
<tr>
<td>PRA</td>
<td>Participatory Rural Appraisal</td>
</tr>
<tr>
<td>RALG</td>
<td>Regional Administration and Local Governments</td>
</tr>
<tr>
<td>REPOA</td>
<td>Research on Poverty Alleviation</td>
</tr>
<tr>
<td>RIPS</td>
<td>Rural Integrated Programme Support</td>
</tr>
<tr>
<td>SAREC</td>
<td>Swedish Agency for Research Cooperation (with Developing Countries)</td>
</tr>
<tr>
<td>SCSRD</td>
<td>SUA Center for Sustainable Rural Development</td>
</tr>
<tr>
<td>SGR</td>
<td>Strategic Grain Reserve</td>
</tr>
<tr>
<td>SIDA</td>
<td>Swedish International Development Agency</td>
</tr>
<tr>
<td>SUA</td>
<td>Sokoine University of Agriculture</td>
</tr>
<tr>
<td>SWAAT</td>
<td>Society for Women and AIDS in Africa- Tanzania Chapter</td>
</tr>
<tr>
<td>TAHEA</td>
<td>Tanzania Association of Home Economics</td>
</tr>
<tr>
<td>TAMWA</td>
<td>Tanzania Media Women Association</td>
</tr>
<tr>
<td>TAWLAE</td>
<td>Tanzania Women Leaders in Agriculture and Environment</td>
</tr>
<tr>
<td>TAWOSTE</td>
<td>Tanzania Women Professionals in Science and Technology</td>
</tr>
<tr>
<td>TFNC</td>
<td>Tanzania Food and Nutrition Centre</td>
</tr>
<tr>
<td>TGNP</td>
<td>Tanzania Gender Networking Programme</td>
</tr>
<tr>
<td>TRHG</td>
<td>Teenage Reproductive Health Group</td>
</tr>
<tr>
<td>UDSM</td>
<td>University of Dar es Salaam</td>
</tr>
<tr>
<td>URT</td>
<td>United Republic of Tanzania</td>
</tr>
<tr>
<td>VPO</td>
<td>Vice President’s Office</td>
</tr>
<tr>
<td>WD</td>
<td>Wildlife Division (Department)</td>
</tr>
<tr>
<td>WED</td>
<td>Women and Education</td>
</tr>
<tr>
<td>WFSPA</td>
<td>World Food Security Plan of Action</td>
</tr>
<tr>
<td>WID</td>
<td>Women in Development</td>
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<tr>
<td>WRDP</td>
<td>Women’s Research and Documentation Project</td>
</tr>
</tbody>
</table>
ANNEX 2. LinKS PROJECT BACKGROUND

The LinKS project is a regional effort in Southern Africa aimed at raising awareness of the value of rural men's and women's knowledge related to the use and management of the agricultural biological systems they depend on for food security. The project seeks to strengthen the ability of local institutions and partner organizations to adopt approaches that recognize and apply farmers' own knowledge and experience for the sustainable use of biodiversity for food and agriculture.

Local farmers have unique knowledge on techniques and skills for use and management of agricultural systems and natural ecosystems. Farmers need to develop local crop varieties, not only to sustain themselves and their families, but also the natural environment. This development takes place through the selection of natural characteristics such as land, weather and water accessibility. The combination of both wildlife and modern technology can sustain development objectives and food security.

The Food and Agriculture Organization of the UN and the Government of Norway support the project entitled Gender, Biodiversity and Local Knowledge Systems to Strengthen Agriculture and Rural Development in Southern Africa (LinKS). LinKS reflects the importance of local knowledge systems and also draws attention to the emphasis placed on establishing links.

LinKS Project objectives

The objectives of the project are summarized as:

1. To increase understanding among rural people, development workers and policy makers about the value of men's and women's distinct knowledge and skills related to the management of agro-biodiversity for food security;
2. To strengthen the capacity of key partner organizations participating in the project to use gender analysis, participatory research and communication for development methods to work with rural communities to document and share information about local knowledge systems with communities, NGOs, research institutes and policy makers.

The project was launched in 1998 and is currently operating in Zimbabwe, Tanzania and Mozambique. Activities in Swaziland are planned to start in the year 2000. The strategy of the project is to build on, and add value to, the on-going work of key partner organizations by providing:

- Training in how to record and document local knowledge and how to use gender analysis and participatory methods for both research and action processes;
- Grants and technical assistance for research on gender-based differences in farmers' knowledge related to agro-biodiversity conservation; and
- Technical assistance to enhance communication and exchange of information about the value of local knowledge in agriculture within and between communities, and with institutions that interact with farmers and with policy makers.
ANNEX 3. WORKING DEFINITIONS OF KEY CONCEPTS

**Gender:** “Gender” is perceived as the culturally defined/determined state of being female or male. It refers to socially constructed and culturally variable roles women and men play in their daily lives. In an operational sense it includes the level of local knowledge attained by women and men on issues of food security and agro-biodiversity and who produces, controls, uses, develops and disseminates the local accumulated knowledge. Gender issues are posed in relation to who are the 'bearers' of local knowledge and who are the 'keepers' of biodiversity for food security.

**Indigenous Knowledge Systems:** These are systematized concepts and cognitive structures, perceptions and classifications of the physical, natural, and socioeconomic environments (Van Vlaanderen, 1999; Brouwer, 1998). Indigenous knowledge systems are disseminated from the adult generation to youth and children and include the unique, traditional, local knowledge systems derived from interactions between people of a given culture and existing within and developed around the specific conditions of women and men indigenous to a particular area. Most cultures tend to encode indigenous (local) knowledge in stories, proverbs, riddles, music, songs and other verbal skills.

**Indigenous Knowledge:** Indigenous Knowledge is largely used synonymously with both "traditional knowledge" and "local knowledge". Yet the three concepts have different meanings. Participants defined "indigenous knowledge" as knowledge pertaining to groups of people with a specific culture. In Tanzania has a large potential because there are more than 120 ethnic groups, some will distinct socioeconomic, political and cultural environments. As Van Vlaanderen (1992) concludes, indigenous knowledge emphasizes knowledge based on internally induced experiences of a particular people. It forms the basis for the so-called "local knowledge".

**Traditional Knowledge:** Knowledge "acquired" from past generations by a group of people who have stayed in a particular environment long enough to have adopted the knowledge. Van Vlaanderen (1999) defines this concept as being ancient, original and historically located to specific customs, conventions and routines.

**Local Knowledge:** Local knowledge depends on factual data, concepts, taxonomies, theoretical models and values derived from the interaction between indigenous androgenous knowledge acquired by people of a given geographical area. In Tanzania, local knowledge can be divided into three basic categories, i.e. "public" knowledge whose access is unrestricted, "discretionary" knowledge that is usually clan-based and is hence accessed along clan lines and "secretive" knowledge which is usually accessed through inheritance. Examples include agricultural and related knowledge (public), tin smithery/pottery knowledge (discretionary) and (secretive) the medicinal knowledge for chronic diseases where special rituals are involved (Kauzeni 1999). This knowledge is usually un-documented and is slowly dying out because of its marginalized status in contemporary formal education and training.

**Agro-biodiversity:** The concept means the variety or diversity within and between the species of agro-ecosystems (including crops, 'wild foods,' livestock, forests and fisheries), the diversity of agro-ecosystems themselves and the diversity of species' varieties, breeds and natural population that interact with agro-ecosystems or contribute directly to food security.

**Food Security:** A situation in which all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 1996).
<table>
<thead>
<tr>
<th>Food Security Issue</th>
<th>Policy/legal intervention area</th>
<th>Implementing institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength and effectiveness of extension services</td>
<td>Agriculture, cd; ralg</td>
<td>(MOAC), MCDWAC, RALG</td>
</tr>
<tr>
<td>Availability, accessibility, and use of farm inputs</td>
<td>Macro-econ; decentralisation, poverty alleviation, community mobilization</td>
<td>PC; LOCAL GOVT. REFORM PROGRAM, RALG, VPO, MCDWAC</td>
</tr>
<tr>
<td>Post-harvest losses</td>
<td>Agriculture, food and nutrition, cd</td>
<td>MOAC, TFNC, MCDWAC</td>
</tr>
<tr>
<td>Transportation infrastructure</td>
<td>District &amp; rural roads national network</td>
<td>RALG, MIN. OF COM. &amp; TRANSPORT</td>
</tr>
<tr>
<td>Produce market network</td>
<td>Co-operatives, agriculture, trade</td>
<td>MOAC, MINISTRY OF TRADE, RALG</td>
</tr>
<tr>
<td>People’s purchasing power</td>
<td>Poverty alleviation, vision 2025</td>
<td></td>
</tr>
<tr>
<td>Social infrastructure</td>
<td>Social development</td>
<td>RALG</td>
</tr>
<tr>
<td>State of general economy at all levels</td>
<td>Poverty alleviation, vision 2025, macro-economics</td>
<td>VPO; PC</td>
</tr>
<tr>
<td>Stakeholder participation in the policy making process, to begin at the grassroots</td>
<td>Constitution, vision 2025, ruling party program, cd</td>
<td>MINISTRY OF JUSTICE AND CONSTITUTIONAL AFFAIRS, PC, MCDWAC</td>
</tr>
<tr>
<td>Governance: level of democratization in structures of decision making in govt &amp; civ</td>
<td>Constitution, civil society, local governments administration</td>
<td>MINISTRY OF JUSTICE AND CONSTITUTIONAL AFFAIRS, VPO, RALG</td>
</tr>
<tr>
<td>Observance of human rights</td>
<td>Constitution, vision 2025</td>
<td>MINISTRY OF JUSTICE AND CONSTITUTIONAL AFFAIRS, PC.</td>
</tr>
<tr>
<td>Appropriateness &amp; adequacy of development policies</td>
<td>Macro-economics, cd, social development, vision 2025</td>
<td>PC; MCDWAC</td>
</tr>
<tr>
<td>Access and control over resources (e.g. land, forestry, wildlife, etc.)by grassroots</td>
<td>Cd, natural resource management &amp; conservation, land, local govt adm.</td>
<td>LINE MINISTRIES AND DEPARTMENTS CONCERNED, RALG, VPO</td>
</tr>
<tr>
<td>Access to natural Resources by disadvantaged groups’</td>
<td>Social development, human rights, natural resources management &amp; conservation, cd, politics,</td>
<td>P C; MJ &amp;CA; MNRT, MCDWAC, PARLIAMENT</td>
</tr>
<tr>
<td>Access to land disadvantaged groups</td>
<td>Lands, local govt. Administration, Constitution</td>
<td>MIN. OF LANDS, RALG, MJ &amp; CA.</td>
</tr>
<tr>
<td>Access to food disadvantaged groups</td>
<td>Lg administration, human rights, Politics</td>
<td>RALG, MJ &amp; CA, PARLIAMENT AND LOCAL COUNCILS, RALG</td>
</tr>
<tr>
<td>Gender equity</td>
<td>Gender, human rights, economics</td>
<td>MCDWAC, MJ &amp; CA ; PC</td>
</tr>
<tr>
<td>Availability and accessibility of social services (viz. Education, health, and water)</td>
<td>Lg administration, education, health, and water</td>
<td>RALG, MIN. OF EDUCATION &amp; CULTURE, MIN. OF HEALTH, MIN OF WATER.</td>
</tr>
<tr>
<td>Availability of rural credit facilities (eg. Saving and credit societies)</td>
<td>Poverty alleviation, cooperatives, lg administration</td>
<td>VPO, MOAC, RALG</td>
</tr>
<tr>
<td>Security, law and order</td>
<td>Security, law Enforcement</td>
<td>MIN. OF HOME AFFAIRS, MJCA, OFFICES OF REGIONAL &amp; DISTRICT COMS;</td>
</tr>
<tr>
<td>Peace and stability</td>
<td>Defence, internal affairs, politics</td>
<td>MIN. OF DEFENCE; MIN. OF HOME AFFAIRS, PMO</td>
</tr>
<tr>
<td>Capacity for self-organization among grassroots &amp; other disadvantaged groups to act</td>
<td>Constitution, policy formulation and development , local councils, civil society</td>
<td>MJCA, PC, VPO, MRALG</td>
</tr>
<tr>
<td>Restoration of agricultural subsidies</td>
<td>Macro-econ. Agric. Policy development</td>
<td>PC; MOAC, RALG</td>
</tr>
<tr>
<td>Food crisis management</td>
<td>Disaster management,</td>
<td>PMO</td>
</tr>
<tr>
<td>Coordination of activities by different actors</td>
<td>Coordination of govt national planning, macro-policies</td>
<td>PMO, PC</td>
</tr>
<tr>
<td>Resources degradation</td>
<td>Environmentalnat. Res. Conservation</td>
<td>VPO, FBD, WD, FD</td>
</tr>
<tr>
<td>Low purchasing power</td>
<td>Micro-econ. Poverty alleviation, cd</td>
<td>PC, VPO, MCDWAC</td>
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</table>
### ANNEX 5. STATUS OF POLICY DEVELOPMENT AND IMPLEMENTATION

<table>
<thead>
<tr>
<th>NAME OF POLICY</th>
<th>DATE ISSUED</th>
<th>REVIEW</th>
<th>PROGRAM OF ACTION AND IMPLEMENTATION STRATEGY</th>
<th>LEGISLATION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Tz Development Vision</td>
<td>Planned for 1999</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM (Ruling Party)</td>
<td>1992</td>
<td>?</td>
<td>The Party Program</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Macro-econ. &amp; other sectoral framework policies</td>
<td>1996</td>
<td>Every three years</td>
<td>Reform programs ongoing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty Alleviation Strategy</td>
<td>June 1998</td>
<td>None planned</td>
<td>- Implementation framework published together with policy - NAP in draft</td>
<td>NA</td>
<td>- Strategy and Implementation framework are published in same doc. - Monitoring guidelines are in draft.</td>
</tr>
<tr>
<td>Agriculture and Livestock</td>
<td>Jan. 1997</td>
<td>Sector review on going</td>
<td>Several sets of operational guidelines for MoAC core functions</td>
<td>Several Special crop acts; - Food Security Act, '91 - Crop Protection Act, '99</td>
<td>- Crop Boards &amp; Food Security Acts are out-dated. Review planned - Policy studies underway to inform review process</td>
</tr>
<tr>
<td>Agric. L/stock, &amp; Nat. Res. Zanzibar</td>
<td>In draft</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Environmental (Tanzania Mainland)</td>
<td>Dec. 1997</td>
<td>Not planned</td>
<td>- Study underway - Formulation of umbrella law after the ILFEMP study</td>
<td>Formulation initiated</td>
<td>PA and IS to be determined by outcome of study of ILFEMP - by end of July 1999.</td>
</tr>
<tr>
<td>Biodiversity Conservation Strategy (BCS)</td>
<td>Under preparation</td>
<td>NA</td>
<td>Being prepared together with the BCS</td>
<td>?</td>
<td>Specific law may not be necessary</td>
</tr>
<tr>
<td>Gender Development</td>
<td>Proposals with Cabinet Secretariat</td>
<td>NA</td>
<td>To be prepared after the approval of policy</td>
<td>?</td>
<td>WID Policy - Until the Gender policy is approved.</td>
</tr>
<tr>
<td>Co-operative Development</td>
<td>Jan. 1997</td>
<td>Not planned</td>
<td></td>
<td></td>
<td>Co-operative Dev. Act</td>
</tr>
<tr>
<td>Wildlife</td>
<td>March 1998</td>
<td>Not planned</td>
<td>PA preparation activities planned</td>
<td>Wildlife Cons-ervation Act of 1974; revision planned</td>
<td></td>
</tr>
<tr>
<td>Forestry</td>
<td>March 1998</td>
<td>Not planned</td>
<td>The Tanzania Forestry Action Plan of 1989; review planned</td>
<td>Forestry Ord. Cap. 389 of 1957; being revised</td>
<td></td>
</tr>
<tr>
<td>National Land Use Plan (Zanzibar)</td>
<td>1995</td>
<td>?</td>
<td>Policy is articulated within the plan</td>
<td>Policy and PA are in the same document</td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td>1997</td>
<td></td>
<td>Preparation of individual activity master plans under way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Development</td>
<td>June 1996</td>
<td>Not planned</td>
<td>National Frame-work for CD Pro-gram is under preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women in Development</td>
<td>March 1992</td>
<td>To be replaced by Gender(?) Dev. policy</td>
<td>Sub-Programme for Women's &amp; Gender Advancement, 1997 (?)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and Nutrition</td>
<td>July 1992</td>
<td>Underway</td>
<td>National Program-me of Action 1992 being revised</td>
<td>To be determined</td>
<td>Policy document consists of statements &amp; implementation guidelines</td>
</tr>
<tr>
<td>Science and Technology</td>
<td>1995</td>
<td>Not planned</td>
<td>?</td>
<td>Tz Com. of Sc. &amp; Technology Act of 1986</td>
<td></td>
</tr>
<tr>
<td>Biotechnology</td>
<td>In Preparation</td>
<td>NA</td>
<td>PA &amp; Policy to be prepared together</td>
<td>Presently under SUREC funded project co-executed by COSTECH, ARI-Mikocheni and UDSM</td>
<td></td>
</tr>
</tbody>
</table>
## ANNEX 6. COMPARISON BETWEEN WID AND GAD

<table>
<thead>
<tr>
<th>WOMEN IN DEVELOPMENT (WID)</th>
<th>CRITERION</th>
<th>GENDER AND DEVELOPMENT (GAD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>An approach that views the women as the problem</td>
<td><strong>The approach</strong></td>
<td>An approach to development</td>
</tr>
<tr>
<td>Women</td>
<td><strong>The focus</strong></td>
<td>Relations between men and women</td>
</tr>
<tr>
<td>The exclusion of women (half of the productive force)</td>
<td><strong>The problem</strong></td>
<td>Unequal relations of power (rich and poor, women and men) that prevent equitable development and women’s full participation</td>
</tr>
<tr>
<td>More efficient, effective</td>
<td><strong>The goal</strong></td>
<td>Equitable, sustainable development</td>
</tr>
<tr>
<td>Integrate women into existing structures</td>
<td><strong>The solution</strong></td>
<td>Empower the disadvantaged and transform unequal relations</td>
</tr>
<tr>
<td>Women’s approach</td>
<td><strong>The strategy</strong></td>
<td>Identify/address practical needs determined by women and men to improve their condition.</td>
</tr>
<tr>
<td>Women’s component</td>
<td></td>
<td>At the same time, address women’s strategic interests</td>
</tr>
<tr>
<td>Integrated projects</td>
<td></td>
<td>Address strategic interests of the poor through people centred development</td>
</tr>
<tr>
<td>Increase women’s productivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase women’s income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase women’s ability to look after household</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>