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EHOLDS & ENVIRONMENTAL CHANGES

THE IMPACT OF GENDER ON LAND PRODUCTIVITY IN TANZANIA

William Rugumamu

The Impact of Gender on Land Productivity in Tanzania

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The Impact of Women's Household Tasks on Land Productivity in Semi-arid Tanzania: The Case of Bahi-Sokoni Village, Dodoma District

William Rugumamu

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FOREWORD

This publication is a partial result of the *Gender, Households and Environmental Changes (GHEC)* research project in Southern Africa. Researchers from all countries of the Southern African Development Community participated with the exception of Angola, where civil unrest excluded field research. The interdisciplinary programme addressed environmental issues within the social context of gender and household. The principal hypothesis of the project was that environmental changes affect men and women differentially, and gender was taken as an analytical tool to look at the impact of the changing environment both within and outside the household. Many rapid changes are taking place, e.g., technological change, and the impact of these overlap and influence each other. Environmental change was selected because it affects women as managers of households when they interact directly with the natural environment in their daily activities of providing subsistence food, collecting water and gathering firewood or fuel. Degradation of the natural environment, so common in the region, also has an immediate impact on men and their ability to raise livestock or grow subsistence and cash crops. Diminishing returns from degraded land is one reason why people migrate to towns. In the urban areas crowded living conditions and pollution create additional problems.

The GHEC country projects addressed environmental problems in particular areas. An innovative video methodology was used in five projects to bring out community-based action to

task which built upon the skills of all participants. Video was used to bring people together to participate in an educational process of creating knowledge, of engaging in debate and reflection that stimulated re-evaluation of traditional believes, views and opinions, and thereby to develop a critical understanding of the self and of the surrounding world.

Gisela Prasad
Co-ordinator, *Gender, Households and Environmental Changes Research Project*

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I wish to record my gratitude and appreciation to the sponsor of this study, the Institute of Southern African Studies, National University of Lesotho. Its completion, however, is a result of a multiplicity of supportive initiatives from individuals and institutions. To this end, I would like to take the liberty of mentioning but a few of these efforts. Thanks are due to the former Director of the Institute, Professor Mafa Sejanamane and the Coordinator of the GHEC project, Professor Gisela Prasad, for pioneering and mobilizing resources and for the encouragement rendered to all researchers, to the village communities in Bahi-Sokoni and their leadership for the two-way learning experience generated during the fieldwork; to the GHEC study group for vibrant academic workshops held to sharpen the research tools, to the University of Dar es Salaam for affording me a conducive academic environment to venture into the field of Gender, Environment and Sustainable Development and to my family that suffered my absence without bitterness on the understanding that the pursuit for truth is both demanding and costly. Finally, to all those who actively or passively participated in the completion of the study.

William, Rugumamu.
APRIL, 1996.

ABSTRACT

In Tanzania, like in most sub-Saharan African countries, agriculture forms the largest sector in terms of income and employment generation. In spite of government formulated development programmes from the colonial period to the present day, one of the major constraints of this sector is environmental degradation resulting in declining food, and energy production, among others.

Since women are involved in the growing of most of the food, collecting firewood and fetching water, they are the most vulnerable to the degrading environment. This study of the Bahi-Sokoni village community, located in semi-arid central Tanzania illustrates the nature of gender division of labour at household level and its impact on land productivity in an economically and ecologically marginal area.

In Bahi-Sokoni village, like elsewhere in the world, gender division of labour at household level is socially created and in this community, it is perpetuated through initiation rituals when young men and women are taught the 'dos' and 'don'ts' of their community. The philosophy cutting across this informal education underscores the role of collective responsibility of a husband and wife to ensure the survival of their family, the clan and the society at large.

In view of the fact that education is a vehicle for development, it was noted that the sample survey showed that access to formal education was such that 40% (33 out of 88 women respondents) of the women population were illiterate compared to 50% (7 out

of 14 men respondents). A more disturbing picture emerged when almost all women claimed to have never benefitted from rural extension services during their farming career on their small plots.

With respect to the domestic sphere, results revealed that all women interviewed (88 out of 88) were involved in all domestic chores including food preparation, maternal activities, house keeping and social obligations while the men were predominantly involved in repair and construction of houses. This means that women's household activities from sun-rise to bed-time appear to be multi-layered leaving no time for the so called economic activities.

On gender and resource use systems, the study revealed that women dominated the traditional food production system while the men feature as responsible only for cash crop production and livestock keeping systems. Women were seen by their men-folk as subordinates.

The scenario was punctuated by differential access to good quality land whereby only 25% of the sample women owned the land they cultivated compared to about 74% of the men. Further, it was found out that the low quality public lands which suffer from erosion, water-logging, low nutrient status and steep slopes were mostly accessible to women in order to produce non-cash and non-staple food crops. Furthermore, the study has shown that while the women were involved in all the farm operations, the men never participated in weeding and thinning which are the back-breaking operations. Over and above taking part in the family farms, women also work on smaller plots to produce food for the family. This means that women have two agricultural calendars in one.

The study points to the need for women's education and active involvement in development planning, a role that can best be played by Non-Governmental Organizations (NGOs). It is concluded that the contemporary household division of labour is not capable of providing conditions conducive to healthy family nor a sustainably productive environment which are essential ingredients in rural transformation in Africa.

1. INTRODUCTION

Statement of the problem

In most sub-Saharan Africa, agriculture forms the most important sector in terms of income and employment generation, accounting for about 80% of the labour force. The bulk of the agricultural products for export and domestic needs is produced by peasant farmers who constitute the majority of the population. Since time immemorial, however, rural women have sustained the struggle for human survival by fulfilling their biological and traditional roles of reproduction and of providing families with food.

It is generally accepted that in sub-Saharan Africa, there is a clear sexual division of labour between crops and farming operations (Jeannie 1984). Empirical study on percentage total labour time has also shown that while men clear the land and turn the soil, women do most of the rest (FAO 1989). Female peasants are indeed traditionally concerned with daily domestic chores namely reproduction, house-keeping, production, management and agriculture. There exists, therefore, a direct relationship between gender, household tasks and the environmental management making women primary managers and users of natural resources. To underscore such an area of common concern, calls for a multidisciplinary approach to formulate an informed socio-economic and environmental policy.

In the Southern African Development Community (SADC) member countries, major development constraints include the

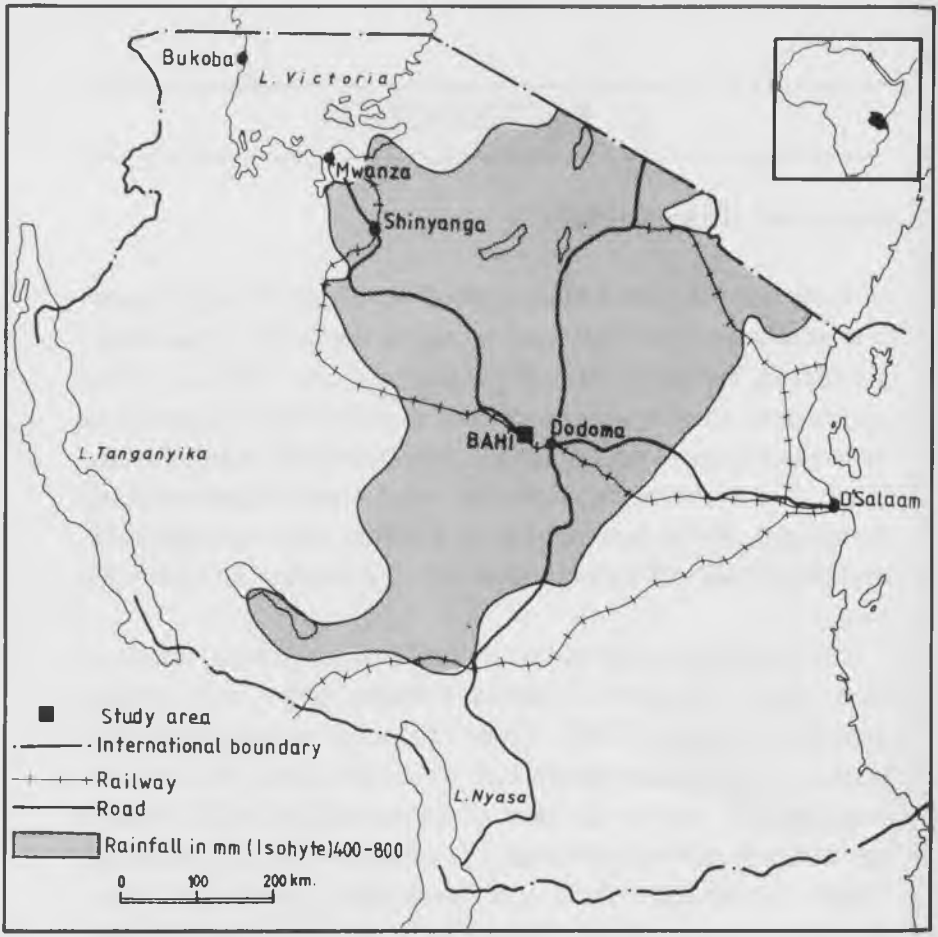

Fig.1. LOCATION OF STUDY AREA.

spread of the Kalahari-Namib desert and the surrounding semi-arid zone, accelerated soil-water loss, loss of genetic diversity, drought and declining food, fodder and energy production. There is evidence of a set of socio-economic and cultural activities as the initiator and victim of ecological degradation (Darkoh 1989; Rugumamu 1991). The ensuing environmental problems are a serious threat especially to the livelihood and productivity of village-based communities as well as to the natural resource base (Agarwal and Narain 1992; Rugumamu 1993).

Given that it is the women who grow most of the food, collect fuelwood and fetch water for the households, they are the most vulnerable to the degrading environment as these resources tend to get further away from homesteads. This impairs efficiency and hence productivity because women have to spend more time on these activities thus reducing effective time and energy for conservation farming and management of a healthy domestic environment.

It should be noted that in some cultures women are treated as servants and male children preferred to female ones, while in other societies women have a high social status, own their property and take part in social debate. In other words the position of women in society is developed through environmental influences like tradition and not naturally ingrained (e.g. biological) (Mbilinyi 1972; Sinare 1979; Mahmoud 1991). Also scientific research has proved that cultural more than biological factors have created masculinity and feminity with regard to sexual division of labour. The negative effect has been the barring of many men and women from jobs and other activities they enjoy and for which they are better qualified in several cases.

Today rural women are not a homogeneous group for they may be differentiated by such variables as literacy, occupation and

income. This study focuses on the rural poor women and poor households' impact on natural resources within the fragile semi-arid environmental setting.

Conceptual issues

The key concepts within the gender discourse have been adequately outlined by Wilson (1993). One of the current conspicuous qualities in an agrarian economy is the gender division of labour, control and responsibilities within and outside the domestic sphere with relatively little gendering.

At the institutional level, gender analysis forms a corner-stone in understanding the structures of gender relation in a community. Gender structuring applies first to relation of production at all levels from the household to national level. Second, it accounts for the role of socialization in determining the way women and men's labour, responsibility and control over resources as defined by society (Rocheleau 1992). It is agreed that gender relation is a cultural category.

It is against this background that gender planning for environmental management should seek to desegregate within communities, households and families on the basis of gender and special gender roles, responsibilities and needs. In this context one is able to capture the multiplicities and overlappings of women's activities (Mahmoud 1991 and Wilson 1993) which by any standards of fairness, are judged to be discriminatory and unprogressive.

Subsistence production, being predominantly undertaken by women in the households are often 'invisible' tasks. The production operations involve a lot of energy and material at the household level. These are essential for the daily maintenance

and nurturance of household members. There is need, therefore, to develop a common standpoint on how to nurture human life and observe the physical and cultural environments.

The concept of a household has been reviewed by Nindi (1992). Being socially produced and culturally constructed, there are many definitions of a household. In an agrarian society a household is the basic unit of operation whose labour, resources and role are shared for the perpetuation of life (Omari 1989). It constitutes husband, wife and children interacting for survival. Following the patriarchal ideology, the husband is the formal head and the ruling power of his family and his authority is final and absolute. The unit, however, is heterogeneous with respect to roles and responsibilities resulting in asymmetrical gender relationship in society. The social formation at the household level forms the basis for underscoring the relation between gender roles and the environment. At an operational level the concept of a household constitutes all of the family members who share meals and who together contribute to the production of food.

The environmental resource base in this study is land. As a general term, it includes soils, climate, relief, hydrology and vegetation to the extent that these influence the potential for land use (FAO 1976). The results of the past and present human activity are also included. The principle objective is to attain sustainable development through a rational utilization of the land resources.

The term sustainable development as a concept has had a variety of interpretations (Darkoh 1993) since it gained prominence in the 1980s. For this report we shall adopt the World Commission on Environment and Development (WCED 1987) definition that refers to "development that meets the needs of the

present generation without compromising the ability of the future generations to meet their own needs". It is this noble goal that guides the analysis of the relationship between women, household tasks and sustainable land resource productivity in the fragile semi-arid areas of Tanzania.

Objectives of the study

This study seeks to investigate the impact of women's household tasks and their food production systems on the sustainability of the productive potential of arable land in semi-arid Tanzania. It is based on the premise that at the household level, food production lies in the domain of women and because women are concurrently mothers, wives, home-makers and household nurses, there is a competing demand on their time, energy and intellect.

The short-term objectives of the study are:

- to identify land related activities and practices that are environment friendly and carried out by women in the process of food and cash crop production;
- to identify cultural, social, economic, ecological and technological opportunities and constraints to gender-based access to, responsibility and control over land for sustainable production of food and cash crops;
- to contribute to a better understanding of gender resource use relationships as a basis for future land tenure policy; and
- to draw some lessons from local level conditions (a relatively homogenous village ecosystem, cultural,

socio-economic and political conditions) and provide policy-makers and researchers with some insight about gender relations at micro-level.

The long-term objectives are:

- to improve the socio-economic status of women at household and community levels;
- to improve household food security;
- to increase household income generated from sale of surplus food based on equitable gender divisions of labour; and
- to combat desertification in the semi-arid zone.

Hypothesis

It is postulated that:

- rural women perform more household tasks than men;
- women are engaged in producing both food and cash crops while men only produce cash crops;
- women's household tasks have negative effects (degradation) on arable land productivity, management and conservation; and
- contemporary policies and laws on human equality (men and women) have remained rhetoric.

Research questions

i) Are household activities gender biased? If so, what is the nature of the division of labour regarding domestic chores between men and women?

ii) Are household farm activities gender biased?
iii) Which forces control access of women to arable land?
iv) To what extent does gender household division of labour influence land productivity?
v) Are farming practices employed on women's plots environment friendly?

The answer to the above questions make Bahi-Sokoni village an interesting diagnostic research area based on base-line data collection and analysis.

Method of study

Before the study a review of literature related to household tasks and their relationships with the environment with special focus on women was carried out. Bahi-Sokoni village located in central semi-arid Tanzania was chosen as the case study. In view of the author's research experience in the area, a participatory observation technique was employed in order to capture specific gender desegregated household and agricultural activities and how they impact on the natural resources.

For the purpose of generating quantitative comparative data, a sample of one hundred and twenty households was randomly selected and interviewed among the cell members interacted with earlier on. Fieldwork also consisted of informal interviews and conversations with leaders from village, district, region and national levels.

Land resource characteristics of the arable and pasture soilscapes were surveyed at reconnaissance scale employing a catena concept in order to evaluate the land quality for a variety of uses and users (Conacher and Dalrymple 1977). This was made possible by incorporating the men and women farmers in

the survey. The three sources of data and information enabled me to cross-check the accuracy and reliability of the collected data through triangulation.

Data was captured using a D-base routine. The analysis and interpretation of data on agricultural activities employed a land use type model (FAO 1983). The approach facilitated the assessment of the impact of gender, household and farm activities on the physical environment over time and space.

2. THE STATE OF THE ENVIRONMENTAL RESOURCES IN TANZANIA

The problem of land degradation

In Tanzania, drought, which may be regarded as a precursor of desertification, has been observed with the on-set of the twentieth century (Amin 1986; DANIDA 1989). Today this problem has threatened almost all the regions albeit with differing intensities. The semi-arid areas receiving a mean annual rainfall of 200-800 mm appear to be most affected, followed by the highly populated mountainous areas characterized by reliable rainfall of more than 1500 mm a year.

It was estimated in 1980 that about 45 % of the country suffered from desertification while 35 % was under threat (Darkoh 1982). The most dominant attribute of desertification in Tanzania is accelerated soil erosion. Water-borne erosion is typical of the humid mountainous slopes and dissected ridges. The semi-arid areas are prone to both wind and water-borne erosion especially on flat lands and gentle slopes. By and large desertification is a real threat to development. This environmental hazard is felt most by the rural poor women in the process of fulfilling their daily household duties, especially food production.

Causes, manifestations and consequences of land degradation

As already noted the root cause of desertification is basically anthropogenic. It is in essence the result of an irrational and inefficient utilization of the natural resources base in the struggle for survival. The key man-related mechanisms that lead to desertification in Tanzania have been listed by DANIDA (1989) to include:

i) Over-concentration and intensification of human economic activities. According to the 1988 census the density of human population, for instance, was such that about 65% lived in only 20% of the total available land area. With the villagization programme, village sizes have tended to remain constant while population has grown and technology stagnated. This situation has led to over-utilization of land with subsequent decline in yields and land quality.
ii) Under-utilization of the natural resource base. Given that only 15% of the available land is under cultivation and that between 1961 and 1985 the area under cultivation has only increased from 3.1 million to 5.2 million hectares, it may be deduced that there is an enormous potential for agricultural expansion in Tanzania.
iii) Fragility of the environment - the naturally infertile soils of the semi-arid environment coupled with unreliable, scanty and torrential rains (25mm/hr) trigger off soil erosion rendering most of these areas unsuitable for agricultural use.
iv) And it may be added that lack of a policy that motivates the private sector to invest in agriculture and related industries has greatly contributed to the gravity of the above problems.

With an unimproved indigenous technology the continued cultivation of marginal lands, overgrazing and the use of indigenous

resources for fuelwood and charcoal, have led to accelerated soil erosion, loss of soil fertility, increased sediment loads in the streams with subsequent reservoir siltation and indeed the genesis of desert-like conditions. It is not yet clear up to now whether it is crop production or livestock keeping which is more destructive to the environment. What is obvious is that the two economic activities are complementary with respect to land use over time and space (Rugumamu 1993).

The above manifestations have had a direct bearing on the decline in the production of food and energy thus creating an imbalance between population and resources. This aggravates the desertification problem by creating a vicious cycle of land degradation coupled with poverty which dictates the urgent need for conservation.

Toward combating land degradation

Government efforts to combat land degradation in Tanzania date back to the colonial times in the 1930s and especially after World War II when there was increased crop production for British industries. The efforts included the introduction of Western technologies developed in the USA and tried in the Far East (Rugumamu 1987). These foreign land husbandry techniques were combined with resettlement, destocking and depopulation policies which were very unpopular with the local people (Cliffe 1972; Kjekshus 1977). Given the heavy-handed attempts to combat the problem of land degradation, these policies were met with resistance, leading to doom. The result was the abandonment of land conservation projects such as the Sukumaland Development Scheme and the Uluguru Land Usage Scheme.

After independence in the 1960's there was minimum effort on environmental conservation (Cliffe 1972). This was so because soil conservation works, being unpopular, were capitalised upon by politicians during the campaign for independence in order to gain mass support. It was not until the early 1970's, in the Second Five Year Development Plan (1969-74), that soil conservation once more appeared in government proposals. During this plan emphasis was placed on the introduction of new crops and fertilizers in an effort to increase yields.

After the Arusha Declaration of 1967, the government created a policy framework incorporating natural resource management in the broader national setting of sustainable social-economic development. However, a number of conflicting sectoral policies have since emerged (DANIDA 1987). For instance the agricultural policy recommends bush-clearing to eradicate tsetse fly while the forestry policy advocates preservation of forest reserves. Within the village context, it is worth noting that major policies such as the Ujamaa (1967), agricultural (1983) and livestock (1986) have left women relegated to lower status.

Policies related to women in national development have been adequately reviewed by the Ministry of Community Development Culture, Youth and Sports (MCDCYS) in the 1988 report. The role of women in attaining sustainable socio-economic development has also been outlined in the Tanzania 1992 Report to the United Nations Conference and Environment and Development (UNCED). In the two key documents the cultural and legal constraints to the promotion of women in development are highlighted.

The establishment in 1983 of the National Environment Management Council to facilitate the coordination and cooperation of environmental issues was a timely act. The formulation of a

"National Conservation Strategy" and now the National Environment Action Plan (NEAP) which seeks to harmonize sector policies and legislations is a commendable step.

The major on-going land conservation projects in Tanzania include: Dodoma Regional Land Rehabilitation (HADO); Shinyanga Region Land Rehabilitation (HASHI); Soil Erosion Control and Agroforestry Project in the Usambara Mountains (SECAP); Soil Conservation in Iringa (HIMA) and Irrigation Project for Marginal Areas (Dodoma, Singida, Tabora, Shinyanga) financed by the International Fund for Agricultural Development (IFAD). However, being interministerial, environmental conservation in Tanzania is hindered by weak institutional linkages.

The success of these projects will depend on the extent to which the users of the land are involved in the planning, implementation and evaluation. In this particular case study, the role of women as major stakeholders is to be highlighted as a basis for designing informed land use rules for sustainable natural resources utilization and improved quality of life of the rural poor.

In terms of research the late 1960's and early 1970's saw a major Swedish - Tanzania research project (DUSER). It was carried out with the aim of assessing soil erosion and sedimentation as well as the policies that guided them. The quantitative studies concentrated on soil erosion and reservoir sedimentation in specific catchment areas in the semi-arid interior plains (Berry *et al.* 1973). Since then there have been some isolated case studies on soil erosion and conservation conducted by individual scientists in various ecological zones (Rugumamu 1991). A recent qualitative study by the Department of Geography, University of Dar es Salaam surveyed the relationship between land

degradation and food insecurity in both semi-arid and humid ecosystems and revealed that environmental degradation contributes significantly to food insecurity and knows no ecological boundaries (GEOSAREC 1990).

It should be emphasized that none of these programmes and studies have focused on the role of women in land related activities and in maintaining productivity.

3. GENDER HOUSEHOLD TASKS AND ENVIRONMENTAL RESOURCES IN BAHI-SOKONI VILLAGE

The state of environmental resources in Bahi-Sokoni

A critical review of the contemporary economy in Tanzania reveals an evolutionary development of the subsistence production characterized generally by a poor performance. Production and distribution are centred on the family unit and the clan, with women and children increasingly bearing the brunt of underdevelopment. Key decisions on the above issues, including consumption, however, are made by the head of the family who normally is a male - the husband.

Like most villages in the semi-arid central Tanzania, Bahi-Sokoni is a home of agro-pastoralists. This is a fragile ecosystem susceptible to periodic drought and floods, accelerated soil erosion, devegetation and occasional annual crop failure. Unlike many other villages in the district, however, it is endowed with seasonal streams and rivers, a flood-plain with extensive marshlands and some hill outcrops, thus making it an area of development potential. In the 1980's the Bahi swampland was singled out as an area of great potential for irrigated paddy production (Rugumamu 1991).

Since colonial times, central Tanzania has been classified as a zone of low agricultural potential (Iliffe 1972; Swai 1980). Areas of low natural resource potential where investments were not undertaken were identified as labour reserves (Iliffe 1972). The

zone supplied predominantly male labour to the then 'modern' colonial economy. This resulted in most women and children performing domestic tasks as well as farm and other activities. The introduction of the cash economy not only accelerated the social status of men but also left the women to manage the land for future generations. To place the study in its proper environmental perspective this subsection outlines the potential and constraints of the physical and socio-economic milieu.

Location and size

Bahi-Sokoni village is situated in Bahi ward, approximately 60 km west of Dodoma municipality (the national capital), along the central railway line and the Dodoma - Singida road (Figure 1). The village borders Mpwematwa village to the east, a boundary marked by a cattle route created by the rich Mpamatwa pastoralists, and Mkakatika village and a gigantic baobab tree from the northern boundary. To the south lie Bahi hill and Bahi-Makulu village and to the west the Msuyani stream and Nagalo village. It is roughly located at 6 01 'S and 28 0 'E within the eastern arm of the East African Rift Valley system. It serves as the ward headquarters. The village size is not accurately known but the district authority puts it at 90 sq km.

Geology and geomorphology

Located in the Rift Valley within the central plateau, the area is characterized by lacustrine and alluvial deposits that overlie Pre-Cambrian granitic crystalline rocks. These deposits are enriched with calcareous materials and form most of the soil parent materials occurring on the plains. The village land extends

on a low-lying to gently sloping depression with the Bubu, Mponde and Kunganira rivers draining into the Bahi swamp, which is characterized by pockets of salt marshes. There are several fish varieties in this swamp dominated by the 'mud-fish'. The northern and eastern parts of the village land are relatively high (80 above MSL) with scattered hills and rock-outcrops (tors and kopjes).

Climate

Falling within the semi-arid zone Bahi receives an average annual rainfall of 520 mm and has a mean of 50 rain-days. During the rainy season (December to April) chances of receiving more than 100 mm per month are low and drought spells are common thus lowering yields. Its geomorphic position makes it more humid than surrounding areas. With temperatures averaging 28°C most of the year, Bahi has a mean minimum of 16°C and a mean maximum of 32°C. Due to continentality the area experiences marked diurnal temperature variations.

The generally high temperatures are conducive to intensive evaporation of both rainfall and groundwater. As a result the mean potential evaporation is estimated at 1200 mm a year with a peak of 250 mm in October. This means that the area experiences a soil-water deficit almost all year round characterized by a short growing period of less than 90 days. Such conditions call for drought tolerant crop varieties.

Soil

The soil resources of Bahi village broadly follow the catenary sequence (Conacher and Dalrymple 1977). Four categories

which are recognized are the skeletal soils of hilloxes, the well drained reddish brown loamy sand of the peneplain, the moderately well drained to imperfectly drained greyish brown sandy loam of the toeslope (swampland margin) and the poorly drained dark grey to black alluvium and cracking clay (Vertisols) of the swampland. Although the quality of the soil varies according to the requirements of the land use types, the productivity of the soil resources of Bahi village decreases from the swampland to the hilloxes. The variation is also repeated by vegetation type.

Vegetation and land use

The dominant vegetation cover include degraded *Acacia* bushes, grassland dotted with baobab trees on the peneplain and swamp vegetation consisting of reeds, sedges and grasses on the swampland. Residual hills are either cleared of vegetation cover or contain stunted bushes and annual grasses. Palm family trees (*Phoenix borassus*) for mat weaving do well on well-drained landscapes. *Terminaria serecea* whose roots are mined for export also do well on the freely draining sites. Generally, the Bahi village is a unique ecological setting that lacks appropriate technology to harness the varied endowed potential which ranges from medium to high.

Afforestation activities are going on in the village as can be witnessed around the divisional headquarters - Bahi-Sokoni. People are also being motivated to plant trees around their homesteads. Agriculture is the most important economic base in the village. In 1990/91 approximately 37% of the village and was under cultivation with the rest being pasture.

Population

The estimated population is 5213 people. There are 2478 males and 2735 females. The population density is 58 persons/km. Given its unique geographical location, the village experiences a marked 'in-migration'. The population includes the dominant Gogo and a minority of Nyaturu, Taturu, Sukuma, Chagga and Nyamwezi communities. The sample survey has revealed an average household size to be 5.8 members with a range of between 2 and 11 persons.

The people are clustered around a central point forming a residential area that bears most characteristics of a township. Houses are separated from each other by narrow roads that finally empty into the major road joining the village to the Dodoma-Singida road.

Land tenure

Although all land in Tanzania belongs to the state traditional system of land ownership is still practiced in Bahi-Sokoni village (Tanzania National Agricultural Policy 1983). Land ownership by individuals or groups of people is either by village government allocation, inheritance, purchase or rent. Grazing land that belongs to the village government is communally owned and utilized although scientifically unconserved and mismanaged.

Beyond the village borders is the public land composed of communally utilized pasture, forest, water resources and game. This land is the least managed and conserved because there is lack of monitoring and surveillance by central government to effect conservation-based land uses.

Basically in Tanzania the question of tenure is one of access rather than ownership of land. This has led to conflicts between subsistence farmers and pastoralists on the one hand and commercial farmers and firms on the other. Because of economic liberalization this calls for an urgent resolution and fortunately the land tenure issue is now under government review.

Social services

An all-weather murram road and railway line connect the municipality of Dodoma with Bahi-Sokoni. There is one dispensary which is poorly equipped. Shortage of essential drugs is a chronic problem. The common diseases are malaria, kwashiorkor, diarrhoea and eye diseases. There are two primary schools with poor teaching and learning facilities. There is an adult education centre, a post-office, a godown, a mobile bank (once a week) a market place, a milling machine and a cooperative shop. There is a daily train service between the village and the municipality.

The main water sources, the Bubu river and its tributaries, have inadequate and unsafe water. The existing water holes and wells are unhygienic and often break down. As a result the village is prone to periodic occurrence of health hazards.

Administrative structure

The village is governed by a council, headed by the chairman, the highest authority in the village. The secretary and different village committees, namely, finance and planning, social services, defence and security are the council's executing arms as postulated in the 1982 Decentralization Act. The lowest organizational level is the cell composed of 10 households and is

headed by the cell leader. In most cases households are headed by males.

Relations between gender and households' division of labour

This subsection deals with the identification of gender division of labour at the household level as a basis for assessing its impact on the environment. Women's household tasks, both domestic and agricultural have been a vehicle for managing and mastering environmental process response relationships. As such women have been prone to negative results of ecological processes of which they have unknowingly played an accelerating and or catalytic role.

For analytical purposes household tasks have been categorised into two, namely, domestic agricultural and non-agricultural operations. The two are intrinsically linked and externally influenced. Household tasks are built around the philosophy of the survival of the family. A family in Bahi-Sokoni constitutes a man and his wife (or wives) and almost always children. Given that the community is patrilineal, the survival of the families means the perpetuation of kinship. At the family level work is shared according to gender and age. Gender roles and responsibilities are built in the Gogo cultural setting (Mbunda 1991).

It is during the initiation rituals lasting for about three weeks that the young men and women (aged between 11 and 13 years) are taught the 'dos' and 'don'ts' of the society. Principally, it is emphasized separately that as husbands and wives they should strive to work together for the betterment of their future families and the entire clan. The education system that shaped the present rural community is both informal and non-formal (Mbunda

1991). It is in this light, therefore, that the impact of the household gender division of labour on the environmental resources should be seen.

The household characteristics chosen for the indepth study constituted gender, marital status, age and education. As for gender, more women were selected in the detailed survey. This was a deliberate bias for several reasons. First, to have as many women involved in a development oriented research as possible. This is important given that most research in rural development often collects data from male respondents only because they are the most active in the public sphere. Second, the female gender is the focus of this study as it seeks to discover their role in the environment and natural resource management.

Table 1: Marital status of respondents

	Married	Single	Widow	Widower	Total
Female	30	37	21	NA	88
Male	14	21	NA	3	38
Total	44	58	21	3	126

One of the household characteristics focused on education. Improved household productivity and income depend on access to knowledge and technology that complements human labour. According to the sample 40% of the women interviewed had no formal education compared to about one half of the male population (Table 2). The table clearly demonstrates that men have greater education opportunities than women even in the rural areas. Traditionally, many parents do not send their daugh-

ters to school on the premise that they should help mothers with domestic and farming activities.

Table 2: Gender and education

Gender	No Formal Education	Adult Education	Primary Education	Total
Women	33	14	41	88
Men	7	7	NA	14
Total	40	21	41	102

The current paradigm of sustainable development calls for reducing human pressure on land at the same time conserving natural resources. Women's decisions count heavily on both fronts and wise decisions will originate from well educated mothers. Hence as natural resources managers, women's roles as farm hand, forest hand and water procurers are enhanced with better education.

Gender relations of production as an organizing construct that encompass economic relations of production means socio-economic relations between men and women. As noted above, the socialist transformation of the Tanzanian society after the 1967 Arusha Declaration failed to significantly restructure gender relations towards 'equality'. The villagization policy did intervene in the traditional productive relations but did not improve the status and condition of women to the same level as men. The proceeding evidence seeks to confirm these hypothesis in the domestic and public spheres.

In housework, which is characterized by reproductive and productive roles, it is reported that a woman spends a total of 1842 hours annually compared to 492 hours by a man to fetch

water, look for firewood, dig, weed, harvest, go to health centres, process cereals, and marketing in and outside the village (UNECA 1991). It is noted further that these activities, which entail walking long distances about 7200 km per year, are over and above household chores and the responsibilities inherent in their reproductive roles.

In Tanzania, women are reported to be working more than men in peasant production but earning less (Omari 1989). Women spend an average of 14 hours a day serving other people. A study conducted by Mnzava (1993) empirically supports a conservative view that the home is a place for women and children. It contends that women contribute more than 90% in household activities - fetching water, collecting firewood, cooking, looking after children and so on. In one instance, Rwechungura (1988) reports that women cover 40 km per week in search of firewood. Citing several studies Mnzava reports that in the Kilimanjaro region a female peasant spends over 45 hours per week in household work as compared to a male peasant's 17 hours while in the Iringa and Morogoro regions the corresponding figures are 56 and 19 hours respectively.

Given the multitude of domestic chores a modest categorization was designed for simplicity and clarity. These included maternal activities, food preparation related jobs, housekeeping and other social obligations. Table 3 shows the domestic division of labour.

The maternal activities include carrying the baby, breastfeeding and nursing members of the household. The food preparation related jobs include gathering, processing and preparing food and drinks, collecting firewood and water and serving meals. The social obligations constitute attending weddings and funerals, religious observances, visiting the sick and other relatives. The

house-keeping activities include tiding up the house, the surrounding, washing up, and minor house repairs.

Field evidence reveals that house-work is mostly done by mothers with some assistance from children. Table 3 shows that all the women interviewed are responsible for all the major categories of domestic chores. Most of the assistance, rendered by girls is in the collection of water and firewood, pounding cereals and child rearing. Young boys (pre-adolescence) also help but to a lesser extent and not in the so-called female specific chores of food preparation. However, with the seven years compulsory primary education, the services of children in the domestic sphere have been reduced. This means that the much needed labour time formally supplied by children has appreciably declined to the women's disadvantage.

Table 3: Household division of domestic chores by gender

Category of work	Female	Male
Food preparation	88	5
Maternal activities	88	2
House-keeping	88	1
Social obligation	88	25

Men's domestic activities include pounding cereals which is done at night to avoid 'social embarrassment'. Men also care for sick children and even their wives by escorting them to the hospital especially when money has to be paid for such services. Occasionally men are responsible for firewood collection as thickets shrink and distances from homesteads increase. Of great importance is the men's role of housing construction. The plastering

of the floor and other decorations, however, remain the women's responsibility. Generally the domestic sphere is dominated by female labour and responsibility.

The above leads one to think that there is no spare time for women to participate in economic activates. An accounting of the daily activities from sun-rise to bed time (10:00 pm) shows that each hour is used in such a manner that most activities are multi-layered. The closely interwoven behaviour of production and consumption makes women's households activities too problematic to categorize. This is also true when one seeks to distinguish between household tasks and economic activities.

One point worth mentioning in the domestic sphere is the low level technology in place. For example pestles and grinding stones are still used for food preparation. Water is still fetched in guards and clay pots and carried on the head and the women have to make several trips a day. This is also true for firewood collection, an activity which is proving tedious as the deforestation proceeds at a fast rate. Piped water supply, grinding machines and energy saving stoves, if made available to these rural societies at affordable prices, would improve the quality of life of the women in particular and environmental quality in general.

It is noted with dismay that women's tasks tend to tie them to domestic activities which seldom get computed into the national GNP (Sembajwe 1980; Bureau of Statistics 1990/91). Mascarenhas and Mbilinyi (1983) have empirically shown that 2.9 mill. economically active women were engaged in agriculture with about 2.5 mill. categorized as unpaid family workers compared with about 2.5 mill. and 0.8 mill. men respectively.

Gender and the environmental resource base

At the household level, the relationship between men and women, as far as natural resources utilization and management are concerned, can best be understood by examining access, responsibility, labour and control over resources (Rugumamu forthcoming; Rocheleau 1992). In order to capture these issues, this report employs the land use type (LUT)/ model (FAO 1983).

Following the above model, Rugumamu (1991) identifies four major land use types.

i) Small holder farming based on improved indigenous technology and rainfed millet, sorghum, maize, cassava, potatoes, legumes, vegetables with or without livestock. This is typical to all households in the village. It constitutes the staple food crops which are also cash crops namely millet, sorghum and maize, and are produced at household level and controlled by men. The remaining minor food crops normally produced by women and children alone form a major component of this land use type.

ii) Small holder farming based on improved indigenous technology and rainfed paddy with or without livestock. This land use is dominated by men although as Table 4 shows a few women have access to land suitable for rainfed paddy. This quality land is very scarce and as a result some wealthy families resort to renting it.

iii) Smallholder farming based on intermediate technology or mechanized irrigated paddy with or without livestock. This type is owned by the resource-rich households who have influence in the village politics. None of the women interviewed claimed to have an irrigation plot. Paddy is basically a cash crop and traditionally the proceeds are kept by men.

iv) Smallholder farming based on improved indigenous livestock breed namely cattle, goats, sheep, donkeys, poultry and on free range with crop cultivation. In this land use type women do not own cattle. Culturally cattle ownership among the Wagogo is a symbol of wealth. A few women own the smaller stock - goats, sheep and poultry.

Table 4: Gender based frequency per each LUT

LUT	Frequency for females	%	Frequency for males	%
i	88	100	38	100
ii	6	7	12	67
iii	0	0	8	21
iv	1	1	4	11

The table also shows that LUT 1 which is characterized by food crops production is the most popular one. It is interesting to note that ownership of livestock (LUT IV) and mechanized irrigation agriculture (LUT III) are male-dominated agricultural enterprises. This is not surprising because cash crop production is the domain of men and women will rarely claim ownership of such resources.

In the agricultural sector, women continue to be discriminated against in the equitable and legal access to land they cultivate (James 1971; Mukoyogo 1993). Land ownership at the household level is the domain of a man who is the head of the unit and is based on lineage. Women's rights to cultivate land for food is derived from their role as wives. This has been entrenched and perpetuated by the parallel nature of the traditional and modern laws (Mbilinyi 1972; Sinare 1979). At the local level the problem

of environmental degradation and lack of a land management culture, may in part be attributed to customary land rights and those provided by modern legislation.

The study reveals that in the three land use types (except for livestock keeping) the sample men interviewed owned the land they cultivated compared to less than 25% of the women (Table 5). Being patrilineal, women simply have access to part of the family land while part of it is left uncultivated. They use this land for the production of non-staple foods.

Table 5: Land ownership by gender

	Number of people owning land	Number of people landless	Total
Women	20	68	88
Men	28	10	38
Total	48	78	126

As regards the mode of land acquisition, the village government is the major institution for land distribution (Table 6). The sample shows a small proportion of women acquiring land through inheritance but a relatively larger number buying land from other villagers.

Table 6: Mode of land acquisition by gender

	Village government	Inheritance	Purchase	Hire
Women	12	2	6	13
Men	25	9	1	8

Strictly, women do not inherit their father's land when they get married. The land acquisition revealed here is predominantly where the women are divorcees or have never married at all. The current parallel land ownership based on traditional and modern laws fails to appreciate women as equal partners with men at the household level and does not ensure sustainable utilization of communally owned natural resources.

After harvesting of the crops, normally livestock are allowed to graze the stubble without the consent of the plot owner. This dry season grazing practice when not controlled, results in overgrazing, soil compaction and pulverization and subsequently arable land degradation. Further, part of the village land is public land where livestock are grazed on free range. Incidentally, these land units are either the very poorly drained sites or the steeply sloping areas which most women say are normally available for cultivating non-staple foodstuffs such as potatoes, cassava, pulses and are also a source of 'wild' vegetables and fruits. The aspect of land quality in relation of gender is reflected in Table 7.

Soilscapes with relatively moderate to high potential for agriculture are owned by men. The marginal soilscapes characterized by limiting soil properties such as low water holding capacity, erosion, water-logging and low nutrient availability are under the mandate of the village government. These areas may be put to agricultural use by any one including women and youths.

Table 7: Access to land quality by gender

Soil Quality	Females' Plots	Males' Plots
Well drained	2	24
Excessively drained	58	13
Eroded	62	12
Very poorly drained	40	30
Fertile	32	21
Infertile	61	15

Given that each farmer has normally more than one plot to cultivate and that these plots are spatially distributed along the village soilscapes, it is not surprising that more women plots than male ones are to be found on poorly productive sites. Being less productive, women's plots are also susceptible to degradation over time as they are put to use. A gender aggregated analysis would not therefore lead to conclude that women's farming methods trigger off land degradation.

Like in most developing countries, peasant farmers bank on household labour in almost all farm operations. As for Tanzania, it has been stated that out of the active population involved in agricultural production 75% are women (MCDCYS 1988). Most of the women are engaged in subsistence farming and are almost solely responsible for feeding their families, either by working with men in communal farms or by working in individual family farms.

As regards plot size (generally referred to as farm size), that is the area a female peasant is able to put under cultivation in any one year, the cropped land ranged between 0.1 and 1.0 ha for paddy and 2.5 ha for intercropped sorghum or millet with

cowpeas or groundnuts. Also, the plots are fragmented depending on the characteristic crop requirements as well as availability of cultivatable land. Further, they tend to lack a specific geometric shape.

The fragmented nature of female peasants' plots on fragile land, tends to spread wide imminent degradation processes thus subjecting a larger area to the threat of soil erosion and desertification, a feature observed elsewhere in Developing Countries (Food 2000).

Sample women peasants who grow paddy employ the traditional rain water harvesting techniques based on the ponding of plots (Majaruba) and also grow indigenous seed varieties. It is important to note that plots which by their setting can be irrigated by the Bubu waters or its tributaries are almost always under household ownership.

As regards other cereals women peasants employ indigenous technology based on flat (sesa) cultivation, humus economy and intercropping with legumes. The system is short fallows (so called commercialized fallow).

Generally the production of crops in Bahi village land is below the potential. The relatively low level of input in terms of fertilizers, insecticides and even labour coupled with unreliable rainfall adversely affect yields and indeed production.

In LUT I the average yield in men's farms for both millet and sorghum stood at 0.5 bags per hectare in a good year compared to women's farms with yields of 0.1 and 45 bags/ha. respectively (one bag = 90 kg). However, for legumes, vegetables, cassava and sweet potatoes no estimates could be made either by the women farmers or the agricultural extension staff. It was acknowledged, however, the production was always enough to see the families through to the next harvest.

The potential for paddy was put by experts at 800 kg/ha. Field evidence shows that under LUT II the yield of rice varied between 0.2 bags per hectare in dry year and 19 bags per hectare in a rainy year. In LUT III a bumper yield of rice was averaged at 36 bags per hectare.

The yield of rice in women-owned plots varied significantly from that of male owned plots in LUT II. Whereas yield in male owned plots averaged at 0.4 bags per hectare in a bad year and 22 bags per hectare in a good year those of female owned plots ranged from 0.2 bags to 15 bags per hectare.

Noting that women are the hub in agriculture, Mnzava (1993) has cited case studies from the Morogoro region revealing semi-quantitatively the farm labour they contribute in the production process.

Table 8: Women's farm labour contribution in the Morogoro region

Activity	Farm Labour (%)
Seed preparation	80
Land preparation	30
Planting and weeding	Mainly women
Harvesting	60
Crop processing	80
Marketing	Mainly women
Income use control	Almost exclusively men

Source: Mnzava 1993.

It is evident that more women than men in the Morogoro region, traditionally peasantry and predominantly matrilineal in setting, greatly support the agricultural industry.

In Bahi-Sokoni, the head of the household assigns farm and livestock duties to the members of the household. This is just a tradition because certain jobs are gender specific.

Table 9: Gender desegregated crop calendar

Agricultural activity	Female	Male	Season
Land preparation	x	x	Sept/Oct
Ploughing	x	x	Oct/November
Sowing	x	x	Nov
Weeding/thinning	x	x	Jan
Bird scaring	x	x	June
Harvesting	x	x	May/July
Threshing	x	x	July/Aug
Storage	x	x	July/Aug

The above table shows that the sample women are involved in all farm activities while men are not. The above demonstrates labour division on the household plots where both staple food and cash crops are grown. It should be noted that women have to find time to work on the subsidiary food crop plots as well. This implies that the agricultural calendar leaves no women's labour time free. In fact women undertake two cropping season in one. This, plus the domestic chores which have to be fulfilled on a daily basis, makes it difficult to differentiate between work and leisure among rural women.

Women's role in the livestock industry is affected by cultural factors and economic constraints. Their role vary depending on the system of livestock keeping (MCDCYS 1988; Omari 1989). These include milking cows, feeding cattle, processing milk products, eggs and to some extent, sale of animals. The proceeds are used at the household level and whatever is left at home is

for the daily food requirement. In Dodoma for instance men are engaged in cattle keeping, selling labour in grape farms and vegetable gardens in order to earn money.

The 1986 national livestock policy tended to underestimate the role of women in this sector. As a result women have been marginalized in the livestock husbandry development and the implementation of the policy has been undermined, leading to stagnation if not decline of the sector.

The major agricultural resources in Tanzania are land, labour and capital. Women normally cultivate small and dispersed plots, utilizing household labour (especially children). They also employ age-old technology (hand-hoe, indigenous seed, organic manure, rain-water dependence etc) (Rugumamu 1992). This reflects the low level of technology employed by female farmers and points to a bleak future in the process of agricultural transformation.

Basically, other than mechanized irrigation, the rest of the land use types are based on improved indigenous technology. The dominant techniques for sustainability of land productivity employed by most farmers in the study area include commercialized fallow, indigenous seeds and livestock breed, multiple cropping, and indigenous pasture management through transhumance. Of the 88 women interviewed none owned a plot in the mechanized irrigated farm category.

According to the survey, farmers are rarely visited by agriculture, animal science, forestry and social work field extension staff. According to Table 10 it is self-evident that more male than female farmers have access to technical advice in soil conservation, fertilizers, mechanization, crop prices and even loans.

Table 10: Frequency of field extension staff visits based on gender

Extension staff	Gender	Frequency			
		Never	Once	Twice	3+
Agriculture	Female	52	2	8	0
	Male	25	3	0	0
Veterinary	Female	80	1	0	0
	Male	12	1	0	0
Forestry	Female	82	0	0	0
	Male	22	1	0	0
Social Work	Female	11	2	0	0
	Male	3	0	0	0

The lack of access to modern scientific and technological developments have led women peasants to technological stagnation if not decline. Judging from the great role the women play in farm management, it is not surprising that the natural resource base in general and the agricultural economy in particular have suffered from decline and degradation. It follows therefore that increased demand on women's time and energy, where the level of technology remains low, means a decline in land quality control and hence low productivity of both labour and land, and a lower quality of life for the household.

Due to persistent low agricultural output some women have opted for non-farm economic activities. The move has reduced pressure on the land resource base thus lowering the rate of environmental degradation. The village market women are involved in micro-enterprises including weaving, selling fish, charcoal, fuelwood as well as rice, maize, beans. Some women are also involved in brewing local beer - a very lucrative business

in the village. Due to seasonal food shortage, the village government is concerned about the brewing of beer that is based on cereals because it compounds the food insecurity situation resulting in famine in resource-poor families.

In view of the existing socio-economic conditions, alternative economic activities are worth cogitating on. As regards non-farm economic activities, beer brewing, petty trade, weaving and sale of labour were common activities undertaken by female peasant.

Table 11: Women's non-farm economic activities, income and season

Activities	No of Women	X annual Income (TShs)	Time Month
Beer brewing	16	15,700	All year
Petty trade	12	24,000	Mar-Dec.
Weaving	14	700	May-Dec.
Sale of labour	8	1,200	Sept-Dec.

Table 11 shows a multiplicity of current and potential activities for non-agricultural economic undertakings in the rural areas. The activities reflect some counter reaction at a micro-scale to the socio-economic ecological imbalance. It may be postulated that availability of capital for establishment of small scale industries such as food processing and handicraft may absorb the idle labour reserve whose agricultural activities contribute to environmental degradation.

4. WOMEN'S HOUSEHOLD TASKS AND ENVIRONMENTAL MANAGEMENT

A Synthesis

A number of opportunities and constraints exist within the cultural and legal frameworks where women's reproductive and productive roles are enshrined. At the family level, equal division of labour between men and women with respect to household chores would relieve the women. This move calls for a community change of attitude and behaviour so that both men and women participate fully in all tasks.

As for child rearing, these should be strategically tackled at the community level in order to provide both time and energy for women to effectively participate in economically productive activities. The approach could be the use of incentives whereby child care, as a community obligation, is remunerated within the agricultural production process or any other rural industry. This measure calls for child care institutionalization through effective involvement of the key stakeholders, the women. In some rural communities success stories of pre-school centres are models to go by.

In agriculture, some women operate two farms - the household which basically belongs to the husband and their own farm which is solely for domestic food supply. Women tend to behave as if they are labourers at their husbands' farms for they have no control over the proceeds. In most cases men and male relatives do not assist women in producing supplementary food crops.

This means that access to farm labour at the household level is another critical problem. As already noted, in the face of multiple demands on the women's labour and time, one finds that the women's only resource is their own labour and that of children.

Given the above situation, women tend to 'scratch' the soil and plant annual crops. Further, with the ever increasing distance to the fields from the homesteads as the demand for arable land increases, women are forced to drastically shorten the fallow period. The common fallow period is between three and five years for most crops. This has significantly contributed to the decline in yields and to the lowering of soil structure stability and hence triggered soil erosion and surface run-off.

Historical and cultural reasons have been attributed to the genesis of the subordinate status of women especially in patriarchal societies (Jeannie 1979; Koopmen 1981; Endeley 1991; Kubed 1993). In addition to inheritance, it is envisaged that there should be mechanisms and processes through which land rights can be transferred from one member of the household or from one household or other management unit to another. In the absence of all this, women have become a silent and invisible force in the perpetuation of society through reproduction and production in support of governments through export and subsistence crops production. Like role sharing with respect to household chores, the same strategy should be applied with regards to cash and food production, as by these tasks women have predominantly contributed to the sustenance of the ecosystems. This creative role of women in the economy and ecology has yet to be accorded its due weight.

The Wagogo, like other African communities, are very sensitive to food shortage. They believe that a man will not get married if it is discovered that the family is susceptible to famine. A

question always asked is "do birds always hung around that homestead?" meaning does that family have enough food all the year round? Should the answer be 'no' then the girl's family will shy away. Despite the blame being labelled at the family level the women carries the blame. Efforts to mobilize and sensitize women regarding their rights should not be spared especially by voluntary agents. This calls for the state to create an enabling environment that makes it possible to generate institutions which make democratic popular participation of all segments of the community in the decision-making process an on-going activity and indeed a reality.

For women to undertake conservation farming, they have to have among other things, access to productive resources, namely land, capital and technology. With reference to land, the major resource in rural areas, traditionally women have no right to own it. As girls or spinsters, they are culturally not eligible for a share of either their fathers' farms or the village land. As married or divorcees they have no traditional rights to their husbands' farmlands. This makes women dependent on their brothers after the death of their fathers or on their sons after the death of their husbands. An intriguing question is "Why should women be expected to reap where they did not sow, and sow where they do not reap?"

Further, since women lack the means to invest in agricultural intensification and soil conservation, their own plots are particularly constrained as far as productivity is concerned. Lack of financial support and fear of risk taking, have mainly excluded them from the use of ox-ploughs for land preparation. It has thus become customary for them to settle with the age-old farm tools and techniques. When used on the husbands' farms ox-ploughs, by clearing larger stretches of land, have increased women's work

because they have much more to weed and harvest. In other words, women have not gained access to the technology which increase their labour productivity.

Empirical evidence reveals that rural women are, in essence, the land resources managers. They are potentially capable of impacting the environment and vice-versa. Should the contemporary gender division of labour remain unchecked, it is most likely that future human existence and the physical environment will be in jeopardy. This trend underpins the need to re-direct research and development efforts towards sustainable rural resources utilization, management and conservation, focusing on the question of the interplay of gender division of labour and environment at household level and vertically across the nation (UNCED 1992 Tanzania Report).

One way out of this problem is the formulation of a land tenure policy and laws that give equal rights to men and women. The policy should incorporate mechanisms that would make it possible for women's subordinate positions to be challenged. It then should address the religious, customary and other social issues that suppress the status of women in society within the reproductive and productive roles.

Within the rural context, being a landless farmer means lack of access to farm credit and agricultural technology education. Ironically, it is the men who traditionally own land who have access to these facilities. It is interesting to note that the men are recruited for seminars and workshops on conservation farming conducted at both village and district levels. Afterwards men pass over these farm inputs to women who apply them on the household farms. Due to pressure on resources and time women are not capable of doing the same on their own food crop plots and hence the essence of differential resource degradation.

Unless the household division of labour is equally spread among men and women, the latter will always be too busy to play their public role. To this end efforts should be redirected to the technology field in order to innovate culturally and economically viable tools that will reduce time and energy to be spent on both domestic chores and crops production.

Conclusion and recommendations

This study, like other village level case studies in Tanzania (Vourella 1987), concurs with findings of other scholars including Akiny (1991) and Ssuda (1993) in Kenya that women are oppressed by men. They are exploited at household level and in the wider economy, as women, as peasant and as proletariat, and super-exploited as part of the third world peasantry. Furthermore, it also agrees with other studies that women's access to the means of production and employment is more constrained than that of men (Mascarenhas and Mbilinyi 1983; Vourella 1987).

Furthermore contradictory customary and modern laws on land ownership and inheritance fail to stimulate sustainable management and conservation of the environment. Sustainable development in this respect should integrate women as stakeholders in planning available and potential natural resources exploitation and management as basis for raising efficiency. One of the key concepts in the process should be the democratization of development planning (Nalwanga-Sebina 1991; Darkoh 1993). It has been acknowledged that rural development policies that do not address women fail because they are the most affected. Therefore, efforts to intensify agricultural development and natural resources conservation will have to be focused on rural women. These efforts will have to be directed to reduce women's

severe time and energy constraints; lowering the barriers to women's access to land; credit and extension services; introducing technologies usable by and beneficial to women; and improving women's educational standards and skills.

An investigation of the root causes for failure of development policies and attendant laws to induce the desired behavioural changes should be undertaken to analyze the circumstances surrounding their promulgation. Legal instruments based on scanty information of the specific social, economic ecological conditions should be repealed as they cannot work. It is argued here that success of development policies and rules should be pegged around a holistic understanding of the behaviour of the various individuals, institutions and attendant opportunities and constraints within which the individuals and institutions are operating.

In view of the evolutionary nature of some proposals outlined above, one way by which the status of women can be changed within a short time is by starting small and basic entrepreneurial activities. Micro-enterprises are capable of producing significant and measurable results within a short time. Given the Wagogo women's active involvement in the informal sector, such as local brew (*pombe*), handicraft (weaving mats, baskets, hats), petty trade and in view of their strategic geographical location, establishment of a revolving fund for micro-enterprises would uplift the status of women and children. When such loans and interest income are recycled within the village, thus creating a larger loan pool each time money is borrowed and repaid, many women stand to benefit from the project. Such a development programme is within the capacity of international institutions such as UNICEF, UNDP, OXFAM America, to mention but a few. The only way such a micro-loan programme can succeed is to have

the women at the centre of the project. The beneficiaries should be involved in the day-to-day decision-making process. It is when the women become the managers of the fund and hence the programme that their commitment to sustain the project will be won.

At the level of development research, gender-based participatory research should be launched as the basis for determining household and hence local level resource relations problems and options as well as sustainable and flexible solutions of the same. Taking the household as the nucleus of analysis, when scaled and linked up such an approach is capable of generating sub-national level action plans and vertically right up to national level policy formulation. To this we should add the influence and power of external forces such as the international market and their articulation with the web of social and ecological relations in place at the village or subnational level (Rocheleau 1992).

Such a study will unveil centrifugal and centripetal forces existing in institutions at all levels, which impact on gender and resources relations. This calls for a multidisciplinary approach that captures and analyzes data and information on the cultural, social, economic, legal and ecological issues in a holistic manner. In the present state of democratic governance, relations between individuals as well as groups should be based on law. Therefore, family resources relationships should be guided by the rule of law. This is a bottom-up approach to rural development.

A national policy to address the issue of an integrated rural development based on private investment in agriculture and agro-based industries and services as well as small-scale industries, mining and ecotourism should be formulated. In such a policy the needs, interests and responsibilities of the rural poor especially women should be sought and articulated in the rules

governing the relations between the poor and the new institutions. It is by involving the stakeholders in decision-making that a lasting solution to gender inequality in relation to resources and land productivity can be found.

All these assertions, based as it were on field observations, lead to the conclusion that the contemporary state of household division of labour is biased against women. It not capable of providing conditions necessary for a healthy family nor a sustainably productive environment that are essential for rural transformation.

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Professor William Rugumamu, a geographer at the University of Dar es Salaam, is interested in research on environment and development. He has participated in programmes for combatting desertification in the African region under UNEP's African Deserts and Arid Lands sub-committee of the African Ministerial Conference on Environment. In Tanzania he has focused on the relationship between agricultural land use and environmental degradation in the semi-arid areas.

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