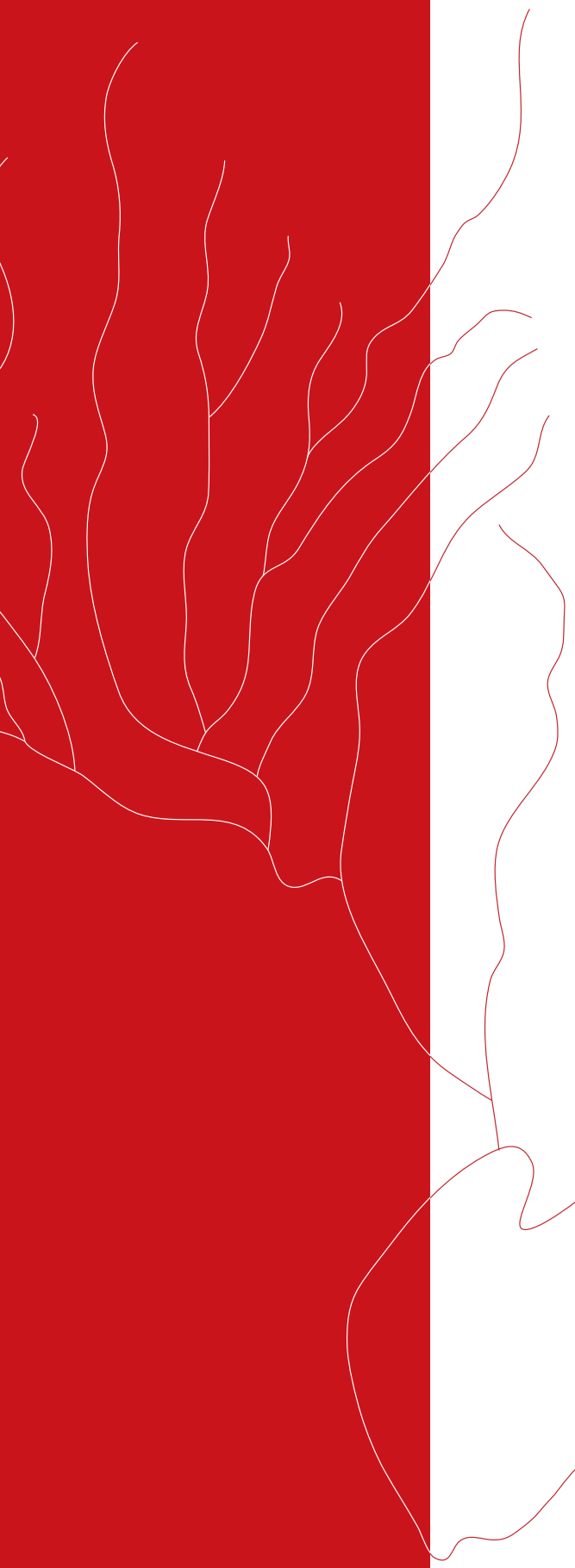

CUVEwaters integrated water resources management

Policy Framework for Small-Scale Gardening

Julia Röhrig (Ed.)
Wolfgang Werner

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Editor
Julia Röhrig

Author
Wolfgang Werner

General Editor
CuveWaters research co-operation
www.cuvewaters.net

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Distribution
Institute for Social-Ecological Research (ISOE)
Hamburger Allee 45
60486 Frankfurt/Main, Germany
Download: www.cuvewaters.net

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The Research Partners

Institute for Social-Ecological Research (ISOE)
Dr. Thomas Kluge (Project Head)
Hamburger Allee 45, 60486 Frankfurt/Main, Germany
Tel. ++49 (0) 69 707 6919-0
E-mail: cuvewaters@isoe.de

Technische Universität Darmstadt
Chair of Water Supply and Groundwater Protection
Prof. Dr. Wilhelm Urban
Chair of Wastewater Treatment Technologies
Prof. Dr. Peter Cornel
Petersenstrasse 13, 64287 Darmstadt, Germany
Tel. ++49 (0) 6151 16 2748
E-mail: w.urban@iwar.tu-darmstadt.de
E-mail: p.cornel@iwar.tu-darmstadt.de

Namibian Partners:
Desert Research Foundation of Namibia (DRFN)
Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ)
Ministry of Agriculture, Water and Forestry (MAWF)
And other Namibian ministries, institutions and organisations

Contact in Namibia: Water Desk Coordinator (DRFN)
Tel. ++264 (0) 61 377 500

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Abbreviations

ADC	Agricultural Development Centre
AET	Agricultural Extension Technician
MAWF	Ministry of Agriculture, Water and Forestry
MAWRD	Ministry of Agriculture, Water and Rural Development (until March 2005)
MDG	Millennium Development Goals
NAB	Namibian Agronomic Board
NAP	National Agricultural Policy
NDP	National Development Plan
NGO	Non-governmental organisation
NNRDP	Northern Namibia Rural Development Project
NPRAP	National Poverty Reduction Action Programme
PRS	Poverty Reduction Strategy
RDSP	Rural Development Support Programme
RoN	Republic of Namibia
V2030	Vision 2030

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1 Introduction

Although Namibia's average per capita income is about US$2,900, many of its people face severe food insecurity at the household level. People who are disproportionately affected by food insecurity include small holder farm communities and poverty stricken urban dwellers (NPC 2008a: 192). While Namibia strives to become an economy that is less dependent on resources and more reliant on the manufacture of goods and service in the long run, small holder food production will remain an important source of income and subsistence for many rural households in the short- and medium term.

Poverty reduction and food security have been central concerns of the Namibian government since Independence. Over the years, government developed a comprehensive framework to address these issues. In terms of food security / self-sufficiency this framework culminated in the Green Scheme Policy of 2004 and its revised version of 2008. The Ministry of Agriculture, Water and Forestry together with the Namibian Agronomic Board actively promoted local food production through the National Horticulture Initiative and the Horticulture Infrastructure Development Programme. In addition several other policies seek to address food security and poverty.

All of these initiatives depend on access to sustainable water abstraction from rivers, dams or artesian sources. Namibia's perennial rivers - the Orange, Kunene, Kavango and Zambezi – are the focus areas for future irrigated horticultural production. Water abstraction potentials from perennial rivers allow for the irrigation of up to 45.000 ha (Grimm and Werner 2005: 16). This represents an area five times larger than the current 9.000 ha under irrigation along the Orange, Kunene and Okavango (Fiebiger et al 2010: 24). In addition to these rivers, big water storage dams like Hardap and Naute and the presence of artesian water in the Auob valley make commercial irrigation possible.

But access to water remains a major limiting factor on food production for the majority of rural households. While major efforts have gone into the improved management of available water resources, much less attention has been given to exploring alternative sources of water for small-scale food production. It is not possible to provide a water tight definition of what constitutes small-scale farming. In the first place, the land areas available to most people for horticultural production vary greatly. It is safe to say that small-scale horticultural production in an urban or peri-urban environment will be limited to backyards of private residential land. It is likely that people in rural areas have more land available for horticultural production. Secondly, small-scale horticultural production also defies attempts to define the activity in terms of whether produce is produced for own consumption or for the market, as both are possible from a backyard garden.

The CuveWaters project aims to further the conceptual development and practical implementation of integrated water resources management (IWRM) in the north central regions of Namibia by exploring the feasibility of utilising water from different sources for different purposes, e.g. as drinking water or water for agricultural purposes. This approach has been referred to as a *multi-resources mix*. Pilot projects have been initiated and implemented involving rain water harvesting, groundwater desalination, sanitation and water reuse and sub-surface water storage.

The multi-resources mix of the CuveWaters approach to IWRM makes additional sources of water available for use in small-scale food and/or fodder production. More specifically rainwater harvesting and the reuse of purified sewerage water open up new possibilities. The promotion of small-scale food production is likely to make a positive contribution to household food

security, and will contribute to Namibia's horticulture development strategy, which seeks to minimise the country's dependence on food imports by encouraging local food production.

The importance attached to household food security is not always borne out by the current policy framework on small scale gardening and in particular urban horticultural production. Given the absence of specific policies and legislation, it is conceivable that small-scale urban farmers using open spaces to grow food could be considered to be doing so illegally. No legal restrictions exist to develop small vegetable gardens on private residential property. However, whether growing vegetables in open spaces of urban areas or backyards of individually owned houses, small-scale urban food producers are not receiving any support from local authorities (Lux and Janowicz 2009: 24).

The current study is investigating the extent to which the current policy and legal framework encourages and guides the development of small-scale horticultural production using alternative water sources. There are two parts to this investigation: the first part of the study provides a brief review and summary of the current policy framework on food security and small scale gardening in urban, peri-urban and rural areas. A second part will shed some light on policy and regulations regarding the use of purified sewerage water for production. Rainwater harvesting is not governed by specific regulations and/or policies, but is encouraged.

Small-scale horticulture or food production defies a neat and water tight definition, as much as this may be useful. In lieu of a proper definition, a few comments will have to suffice to convey a sense of what small scale food production is referring to. One study on the identification of local markets for small-scale farmers in South Africa tried to define small-scale farmers by juxtaposing them with large-scale commercial farmers within the dualistic structure of South African agriculture. It referred to the sector as 'subsistence and/or small scale agriculture' and simply stated that compared to the large-scale commercial farming sector, the 'subsistence and /or small-scale agriculture sector' was characterised by large numbers of producers (Joss and Mudhara 2007: 11).

Clearly, this characterisation describes what small-scale producers are not, rather than what they are and leaves the definition of small-scale food production wide open. Should it be defined from the perspectives of individual rural and urban households or in relation to large-scale commercial farms, for example? To illustrate the point: one hectare of high value crops such as red peppers may be close to the limits of what some households are able to cultivate due to limited access to labour, for example. In the overall scheme of agriculture, however, a one hectare food plot is likely to be considered small. In addition, attempts to define small-scale horticulture are further bedevilled by the fact that irrigators cultivating 20 hectares under the Green Scheme are considered small-scale commercial irrigators.

In the Namibian context the earliest definition of what 'small scale market oriented gardening' meant was produced by Helmstetter (1995: 3) in the context of the Northern Namibia Rural Development Project (NNRP). He stated that small-scale gardens as used in the NNRP context referred to gardens covering a few hectares and being cultivated by small groups of gardeners of 6 to 12 people. Two projects he described in more detail – Epalela and ELAO in Omusati Region - cultivated 1,4 ha and 2 ha respectively and consisted of 14 and 20 members. This amounted to an average area for cultivation of 1.000m^2.

A more recent study on urban and peri-urban gardening in Namibia (Dima et al 2002) also did not develop a general definition of small-scale gardening but provided an indication of the areas cultivated in a peri-urban garden project in Oshakati, where the 12 members of the Tukondjeni Project cultivated on average 225m^2 each (Ibid: 57). The scale of urban agriculture in townships

is clearly limited by the average size of residential erven. For Windhoek the minimum size of residential plots has been given as 300m^2 (Ibid: 59). Considering that people have residential units on 300m^2 plots, the size of gardens in a typical Windhoek township are likely to be very small. In peri-urban areas of Oshakati and other towns in the north-central regions, space is less of a constraint on the size of gardens (Ibid: 80). In Rundu urban, vegetable production using drip irrigation takes place on no more than 50m^2 (Own observation February 2011).

This brief discussion suggests that the sizes of small-scale urban gardens appear to be far less than 300m^2 if Windhoek is taken as point of reference. In peri-urban areas sizes of gardens are likely to be bigger, as the Tukondjeni Project suggests. For non-urban or non peri-urban areas, access to land is not likely to be a constraint on the sizes of gardens. Instead, access to water, labour power and appropriate technology will be the most important determinants of garden sizes. As stated above, at Epalela 1.000m^2 per cultivator was described as small-scale.

The present study is based mainly on desk work. The information provided here will make it possible to obtain a clearer picture of the potentials and limitations of scaling up current pilot projects.

2 Food security: the policy framework

A month before Namibia gained its Independence in March 1990 a report on *Household Food Security in Northern Namibia* was published (Hay et al 1990). It was commissioned by UNICEF. While the data presented in the report is outdated, the report remains useful in clarifying some basic concepts about food security. It may be useful to briefly review these clarifications in view of the fact that it is not uncommon that the concepts of *food security* and *food self-sufficiency* are used interchangeably.

Hay et al (Ibid: i) point out that food security has two basic dimensions: (i) a sure supply of food to meet market demand (*national food security*); and (ii) an adequate and stable demand for food by households (*household food security*). National food security exists when food supplies in the country are sufficient to meet the demands of its population. Risks of failure in food supplies should be low to prevent shortages and concomitant price rises, which are likely to impact most severely on poor households. Namibia can be said to be food secure, even though it is not self-sufficient in food production. This is so because it is able to import the food stuffs it does not produce.

However, food security at national level does not necessarily imply that all households have access to sufficient quantities of food to meet the requirements of family members (Ibid: 2).

If people cannot grow or buy enough food to eat and if social and public food redistribution mechanisms fail, there will be starvation even in the middle of plenty (Ibid).

Household food security, therefore, is not necessarily a reflection on whether there is a shortage of food or not. Instead, it is fundamentally a question of food distribution or, put differently, access to food in particular by poor households which are generally starved of cash and not always served by proper market and other infrastructure.

In the 1990s the notion of *food sovereignty* was added to the debate on food security. This was defined as ‘the right of peoples and sovereign states to democratically determine their own agricultural and food policies" (Wikipedia: *Food sovereignty*). The concept tried to go beyond food security which is commonly defined as certainty of having enough food to eat each day. Critics

of the notion of food security argued that the notion simply referred to a situation where everyone 'must have the certainty of having enough to eat every day...but says nothing about where the food comes from or how it is produced' (Wikipedia). *Food sovereignty* seeks to place the perspectives and needs of the majority of the population in the centre of the global food policy agenda by promoting and supporting small-scale farmers to produce food rather than to industrialise these sectors. The approach helps to refocus the control of food production and consumption on localised food systems (Ibid).

2.1 The problem

Many households in Namibia are poor and hence vulnerable to food insecurity. Using a 'cost of basic needs' approach to determining the extent of poverty in Namibia, the 2003/2004 Namibia Household Income and Expenditure Survey which was carried out by the National Planning Commission revealed that 26.7 per cent of Namibian households were considered poor of which 13.8 per cent were severely poor (RoN 2008c: 6). Poverty incidence varies greatly between urban and rural areas. In rural areas the incidence of poor households is 38 per cent compared to 12 per cent in urban areas. Of the former, 19 per cent are severely poor compared to 6 per cent in urban areas (Ibid: 9).

The regions with the highest incidence of poverty are Kavango (57 per cent poor), Ohangwena (45 per cent) and Oshikoto (41 per cent). Omusati Region follows in 5th place with 31 per cent of households classified as poor (Ibid: 10). The regions with the highest share of poor households are Kavango (17.8 per cent); Ohangwena (16.5 per cent), Oshikoto (12.7 per cent); Omusati (12 per cent) and Oshana in 6th place with 6 per cent (Ibid: 11). Moreover, of those households that claimed that subsistence farming was their main source of income, 40 per cent were poor and 28 per cent severely poor (Ibid: 15).

Against this background it comes as no surprise that about one-third of Namibia's population was identified as being in need of humanitarian food assistance in 2003. Preliminary data from the Namibia Demographic and Health Survey of 2006 suggested that almost 30 per cent of under 5 children were stunted, implying long-term malnutrition (RoN 2008a: 194). One indicator bearing this out and demonstrating the vulnerability of small-scale farmers practicing subsistence farming consists of the real value of subsistence farming. According to the National Accounts, 1996 - 2006 the real value of subsistence farming peaked in 1998 where after it declined dramatically, reaching less than 50 per cent of its 1998 value in the years 2002 and 2003 (RoN 2007: 16; RoN 2008a: 194). NDP 3 ascribes the major impediments to achieving a meaningful reduction in poverty primarily to low and erratic rainfall and poor soil quality which limit more intensive forms of agricultural production (Ibid: 194).

However, several additional factors can be adduced that combine to bring about household food insecurity (RoN 1995a: 7-8; Hay et al 1990: 5-6). A lack of resources at the household level contributes towards lower yields. This lack of resources includes, for example, that approximately 50 per cent of households in the north-central regions do not own livestock and hence either do not have access to draft power for cultivation or are dependent on those who own livestock. In addition, most soils are poor and road infrastructure poor (RoN 2008a: 194). Moreover, most households do not have sufficient labour power to utilise their land to its optimum. Young people are at school and many family members have migrated to urban areas in search of employment, leaving women to head up households. In 2001 the percentage of female headed households in the north-central regions ranged from 50 per cent in Ohangwena to 62 per cent in Omusati Region (Werner 2008: 6).

Production technologies in the north central regions also have not changed dramatically over the last few decades to compensate for losses in labour power and highly variable annual rainfall. Consequently, agricultural yields are very low, leaving many households with inadequate food supplies. This has increased their dependence on cash incomes in the form of remittances, wages, and pensions. Despite this transition from a subsistence to a cash based economy, at least half of all households in the north-central regions stated that subsistence farming remained their main source of income. According to the *Preliminary Report* of the 2003/2004 Namibia Household Income and Expenditure Survey, 80 per cent of households in Omusati Region claimed that subsistence farming was their main source of income compared to 58 per cent in Ohangwena Region. The corresponding figures for Oshana and Oshikoto are 48 per cent and 50 per cent respectively (RoN 2006: 17). 'Subsistence farming was the main source of income for virtually all poor households' (RoN 2008a: 194).

This brief discussion serves to underline the continued importance of household food security as a national issue in Namibia. While the Government of Namibia responded very early by developing a comprehensive framework on food security and nutrition, it is questionable whether sufficient attention was given to encourage local level food production and thereby improve household food security. This chapter will provide a brief overview of the current policy framework on food security. It will not discuss specific projects and/or agencies implementing such projects.

2.2 Food and Nutrition Policy

A year after Namibia gained its Independence, Government initiated efforts to formulate a national food and nutrition policy which was published in 1995 (RoN 1995a). In the preamble to the policy, Namibia's founding President stated that 'the fight was no longer for freedom from political domination, but for freedom from hunger and malnutrition...' To achieve this aim, farmers not only needed to be encouraged to produce more food and agricultural crops, but food markets, particularly at the local level, needed to developed to ensure a stable supply of food at reasonable prices. NGOs and private sector institutions had important roles to play in implementing projects that promoted food security. 'These institutions must be encouraged to accept their role in tackling hunger and malnutrition', the Preamble stated (RoN 1995a: nap. [i-ii]).

In a separate booklet entitled *National Declaration on Food and Nutrition* (RoN 1995(b)) the Founding President elaborated Namibia's commitment 'to eliminate hunger and to reduce all forms of malnutrition'.

The *Food and Nutrition Policy* states that for households and individuals to have good food and nutrition status they must have:

- Access to adequate resources to grow or purchase the necessary food commodities;
- The knowledge and understanding to use those resources to their best advantage; and
- Access appropriate services, such as safe water, health clinics and reliable markets structures to enable full exploitation of resources (RoN 1995a: 15).

The *Policy* proposed to address household food insecurity, *inter alia*, by 'increas[ing], stabilis[ing] and/or diversify[ing] subsistence production of nutritionally sound food commodities' (Ibid: 16). It stated that agricultural extension programmes would 'be developed to increase and stabilise production of grain, vegetable and fruit crops where water resources permit, both to increase farm household consumption and to improve availability on local markets'. In addition, access to resources and service required for agricultural production should be ensured for all

farming households (Ibid: 17). Recognising the importance of competitive food markets both in terms of generating incomes and improving access to food, the *Policy* committed government to the removal of all obstacles to the development of competitive food markets, particularly at local level. Proposed interventions included better infrastructure for improved access to markets, developing market information systems and improving access to credit for marketing agents and small scale producers (Ibid: 29-30).

In urban areas, the *Policy* regarded employment in the formal and informal sectors as fundamental to improve household food security (Ibid: 18).

In a sub-chapter on *Providing adequate social and supporting structures*, the *Policy* highlights the importance of nutrition research and planning. Amongst other things it states that research into food consumption, food habits, and into appropriate methods for monitoring accessibility and availability of food...must be encouraged to enable programmes to be more effectively focussed and targeted' (Ibid: 31).

The *Food and Nutrition Policy* presents a comprehensive framework to address food insecurity. However, strategies to achieve an improvement in household food security are based solely on productivity increases in existing agricultural practices. No attempts were made to develop new or alternative ways to produce food, let alone encourage small home gardens in rural and/or urban areas.

In order to implement the *Policy* in a co-ordinated and coherent manner, the first *National Food Security and Nutrition Action Plan* was developed and published in 1995 (RoN 1995c). It proposed specific actions to address issues related to food and nutrition. These included food systems, health, human resources development, institutional issues, production and technology (Ibid). An elaborate institutional framework was established to oversee implementation. This consisted of the *National Food Security and Nutrition Council*, which was supported by a *Food Security and Nutrition Technical Committee* which in turn received support from a *Food Security and Nutrition Secretariat* (RoN 1995a: 33).

In 1996 Namibia adopted seven commitments contained in the *World Food Summit Plan of Action* which aimed to reduce the number of undernourished people worldwide by half by the year 2015. The MAWF regularly reviewed progress made towards achieving these commitments (MAWRD 2004) and had incorporated the seven commitments into its strategy paper for agricultural development, Horizon 2010 (MAWRD 2000).

The seven commitments to eliminate hunger and poverty adopted by Heads of State during the World Food Summit in 1996

1. Create an enabling environment for achieving sustainable food security for all;
2. Implement policies aimed at eradicating poverty and inequality;
3. Pursue participatory and sustainable policies and practices for rural and agricultural development practices;
4. Ensure that trade policies are conducive to fostering food security for all through a fair and market oriented world trade system;
5. Endeavour to prevent and be prepared for natural disasters and human emergencies; and
6. Promote optimal allocation and use of investments to foster human resources, sustainable food, agricultural systems, and rural development; and
7. Implement, monitor and follow up on the Plan of Action (MAWRD 2000:24).

More recently, *Food Security and Nutrition Actions Plan(s)* were developed by government for every region in the country for the period 2006-2015. The aim was 'to ensure participation and close collaboration with the primary beneficiaries at the regional, constituency, and community level' by using participatory planning tools in each constituency (See e.g. Ohangwena Regional Council n.d. [2006]: i). These *Action Plans* were published by Regional Councils.

The *Oshikoto Region Food Security and Nutrition Action Plan* (n.d. [2006]: 21) provides a brief description of the planning process (See also Oshana Region n.d. [2006]). The process of developing Action Plans started with a National Food Security and Nutrition Assessment at community, constituency and regional levels. By means of a series of workshops at these different levels, an attempt was made to obtain baseline data and information on the food security situation in each region and to validate problems, constraints and opportunities related to food security and nutrition as well as identify action themes to address these issues.

Three cross-cutting objectives to address the underlying causes of food security and malnutrition in Namibia were identified as follows:

- To improve access to adequate resources to grow or purchase necessary food commodities;
- To improve knowledge and understanding needed to use those resources to their best advantage
- To improve access to appropriate services (Omusati Regional Council n.d. [2006]: 16)

The *Action Plans* for regions do not reflect much in the line of baseline data regarding food security. However, they all contain a number of different project ideas in agriculture, the general economy, fisheries, tourism and other sub-sectors aimed to improve food insecurity. All north-central regions have suggested project concepts to diversify agricultural production with a view to increase agricultural output (Oshikoto Regional Council n.d. [2006]: 27f). The community-based income generating activities proposed in the Oshana *Action Plan* (n.d. [2006]: n.p.) include the establishment of vegetable gardens in 4 specified localities and in Omusati the diversification into backyard gardening, agro-forestry and poultry counted among the strategies to improve production (Omusati n.d. [2006]: 17).

Although these *Action Plan(s)* have been published for all regions in 2006, it is not known how many projects that were identified have been implemented. It is significant, however, that the implementation of *Action Plans* is understood to hinge on intra-regional consultations of stakeholders as well as regional implementation. This suggests that the introduction and possible rolling out of small-scale gardens with a view to improved food security should happen in close co-operation with regional Directorates of Planning. In at least two regions – Ohangwena and Oshana – various capacity building programmes aimed improving regional capacities regarding food security and nutrition have been implemented since 2001 (Ohangwena Region, n.d. [2006]: 9; Oshana Region n.d. [2006]: n.p.).

2.3 National Agriculture Policy

The *National Agriculture Policy* (NAP) was formulated within the overall national development objectives set out at Independence, which focused on the alleviation of poverty and a reduction in income inequalities. The overall goal of the *Policy* 'is to increase and sustain levels of agricultural productivity, real farm incomes and national and household food security within the context of Namibia's fragile ecosystem' (MAWRD 1995: 5).

The NAP addresses the potentials and limitations of irrigation. It argues that irrigation projects should only be implemented where they are economically viable, technically feasible and environmentally sustainable. It also points out that experience in Africa has shown 'that large-scale pumped irrigation has not been a cost-effective way of providing employment and incomes for rural families. Low cost small-scale irrigation, using appropriate technologies, holds greater promise'. Based on these findings, the MAWF will encourage

the use of cost-effective irrigation methods, such as, but not limited to, community-based mini dams or catchment basins for water harvesting and micro-irrigation techniques including drip irrigation-cum-mulching methods through investment incentives (Ibid: 29-30).

The NAP also committed MAWF to formulate strategic plans to implement the most cost-effective and economical approaches to developing small-scale irrigation systems. 'Micro-irrigation, water storage and water harvesting and conservation practices will be given priority.'

Goals and objectives of the National Agricultural Policy 1995

Specific objectives of the NAP are to

- achieve growth rates and stability in farm incomes, agricultural productivity and production levels higher than the population growth rate;
- ensure food security and improve nutritional status;
- create and sustain viable livelihood and employment opportunities in rural areas;
- improve the profitability of agriculture and increase investment in agriculture;
- contribute towards the improvement of the balance of payments;
- expand vertical integration and domestic value-added for agricultural products;
- improve the living standards of farmers and their families as well as farm workers;
- promote the sustainable utilisation of the nation's land and other natural resources; and
- contribute to balanced rural and regional development based on comparative advantage.

At the same time, the NAP envisages the role of government to be limited to providing support services such as research and extension services, minimising adverse public health consequences arising from irrigation and training planners and irrigation engineers.

2.4 Poverty Reduction Strategy for Namibia and National Poverty Reduction Action Programme

The plethora of sectoral policies and strategies aimed at reducing poverty and malnutrition called for an integrated framework that would assist in focusing on key priorities by providing a common vision for development. In addition, many existing strategies focused on agricultural development, paying less attention to the need to diversify rural incomes. The *Poverty Reduction Strategy* (PRS) (RoN 1998) which was approved by Cabinet in 1998, attempted to present an integrated strategy for poverty reduction. It focused on three areas that were considered essential to reduce poverty. These were

- how to foster more equitable and efficient delivery of public services (in the context of Namibia's commitment to regional decentralisation) for poverty reduction countrywide;

- how to accelerate equitable agricultural expansion, including consideration of food security and other crop development options; and
- options for non-agricultural economic empowerment, including an emphasis on the informal sector and self-employment options.

The PRS emphasised the need for a public-private partnership in developing income generation and safety net initiatives. In this context the *Strategy* referred to the need to improve livelihoods in the agricultural sector. It acknowledged that the agricultural resource base was weak, but saw possibilities in the short-term to increase productivity and diversify crops. Against this background it recommended that the livestock sector be further developed and crop productivity and value be increased in the northern and north-eastern regions. Several actions including the development of viable technologies for *mahangu* production by small holder farmers and improved agricultural research and extension were identified (Ibid: 11-12).

Significantly, the PRS argued that gains in productivity could be made by introducing new crops and developing new ways of using water. Viable irrigation projects should combine low cost irrigation systems with high value crops. These should operate on a scale that would not result in a significant draw down of existing water resources. They should also bring new technologies and market linkages into the regions. It proposed to develop a peri-urban vegetable project on 30-50 hectares of land in the Oshakati / Ondangwa area. The *Strategy* foresaw to obtain water from the canal for small-scale irrigation (Ibid: 12).

After Cabinet approved the PRS in 1998, it gave instructions for a *National Poverty Reduction Action Programme* to be developed. The objectives of the *Action Programme* were to elaborate on the PRS and describe measures that needed to be taken to ensure its implementation. In 2002 the NPRAP for the period 2001-2005 was published (RoN 2002). Action 22 stated that MAWF should initiate the development of peri-urban vegetable production, and once the feasibility of this approach was proven, roll out the initiative to other areas. NPRAP reiterated the need identified by RPS to draw water from the canal for irrigation. Alternative sources of water were not anticipated (Ibid: 42).

2.5 Vision 2030 and NDP 3

The new millennium saw the publication on Namibia's *Vision 2030*. This document continues to guide Namibia's development until the year 2030. This vision is based on a comprehensive policy framework and Namibia's development experiences since Independence. The long-term vision presented in V2030 is broken down into 5-year planning periods referred to as National Development Plans. Currently, Namibia is following *National Development Plan 3* covering the period 2007/2008 to 2011/2012.

Under the sub-title *Prosperity, Harmony, Peace and Political Stability, Namibia Vision 2030* (RoN 2004) presents Namibia's policy framework for long-term national development. The overall vision of V2030 is that by 2030 Namibia will be 'a prosperous and industrialised' country, 'developed by her human resources, enjoying peace, harmony and political stability'. By 2030, poverty will be reduced to a minimum and the existing pattern of income distribution will be more equal. The current Gini coefficient of 0.67 will be reduced to 0.3 by 2030.

V2030 links future prosperity of Namibia to a transition from a resource-dependent economy to one that thrives as producer of manufacture and services. However, in the short- to medium term the majority of its people will rely on a multitude of incomes, which includes small holder farming.

The objectives of V2030 include that the population of Namibia is food secure by 2030 and enjoys a high standard of living. One strategy identified to reach this goal is to create 'access to abundant, hygienic and healthy food, based on a policy of food security' (RoN 2004: 41). The Vision acknowledges the importance of irrigation as a strategy to create employment and contribute towards food security and self-sufficiency. However, the cultivation of high value crops such as dates and grapes is recommended, while water-intensive goods such as maize should be imported.

Based on this objective, NDP 3 has adopted *Quality of life* as one its Key Result Areas (RoN 2008: 171-201). The eradication of extreme poverty and hunger is one of the goals identified under this heading and the data provided in support of this goal are sobering. One strategy to achieve the goal of reducing extreme poverty and improving food security is to 'strengthen and diversify the agricultural base of poor rural communities through measures that diversify and improve agricultural production to ensure food security and expanded livelihoods with attention to gender equality' (Ibid: 195).

During the NDP3 period, the agricultural sub-sector aims to 'improve levels of food security at both household and national levels and to create employment opportunities' (Ibid: 98). One of the programmes under NDP3 involves the improvement of crop and horticultural production including the sustainable utilisation of soils. Indicators and targets for the sub-sector concentrate on increased yields for pearl millet (*mahangu*), maize dryland cowpea and bambara nut production. In addition, the sub-sector aims to decrease the importation of horticultural produce, improve the marketing of *mahangu* and maize and increase the cultivation of indigenous plant resources (Ibid: 99).

The crop and horticulture improvement programme intends to promote 'alternative crops' which it defines as 'less well established crops that have some potential for growth, and are alternative to the crops traditionally grown in the country, such as oil seed, fibre plants and bio-fuel'. This component is complemented by the 'domestic fresh produce / horticulture component (which) focuses on the production of fruits and vegetables that are sold in the local market' (Ibid: 32).

This brief discussion suggests that the agricultural sub-sector aims to improve productivity and outputs of staple grains, while simultaneously encouraging the diversification into less well established crops and increased domestic horticulture primarily for the local markets and own consumption. There is no reference in NDP3 on what scale the production of fruits and vegetables is envisaged to happen. However, the apparent importance attached to establishing alternative crops aimed at improved household food security allows for the establishment of small scale gardening units wherever this is feasible and sustainable.

2.6 National Horticulture Initiative

In 2001 the Ministry of Agriculture, Water and Rural Development formulated the *National Horticulture Initiative* with a view of

enhancing the quality of horticulture produce to the consumer and simultaneously furthering employment creation, stimulating the economy and industrial development as well as addressing food security and self-sufficiency among national communities (Price Waterhouse Coopers 2005: 8).

A National Horticulture Task Team was tasked to investigate the feasibility of developing infrastructure for the marketing of horticultural produce in Namibia. This study was necessitated by the fact that local horticultural producers found it difficult to penetrate the Namibian market as

this was dominated by large South African wholesalers who procured their produce in Johannesburg and Cape Town (Ibid: 9). The development of a horticulture marketing infrastructure was considered essential for any large scale development of horticultural production in Namibia (Ibid: 12).

In 2004 the *Namibian Horticulture Market Share Promotion Scheme* was introduced to encourage and facilitate improved market access of local horticultural producers. By means of an import control permit mechanism the Scheme forces local wholesalers of fruit and vegetables to procure a minimum percentage of produce locally before being issued with an import permit for horticultural food items (Price Waterhouse Coopers 2008: 11). This percentage is increased gradually in accordance with Namibia's ability to produce more locally. This measure is aimed at promoting the local production of food and vegetables through import substitution.

2.7 Green Scheme irrigation policy

Against the background of two FAO World Food Summits in 1996 and 2002 and the New Partnership for Africa's Development (NEPAD), as well as the *National Horticulture Initiative* the Government of Namibia decided to invest large amounts of capital in the agricultural sector 'to increase local production in order to obtain food security and food self-sufficiency' (MAWF n.d.: 5). In 2003 Cabinet decided that a policy for the development of irrigation be drawn up. This culminated in the *Green Scheme Irrigation policy* (MAWF n.d.). The model chosen by Cabinet for irrigation consisted of a joint enterprise which tied small-scale irrigation farming units to a commercial irrigation farming enterprise (Ibid: 5). The fundamental aim was to establish commercially viable irrigation enterprises on communal land that was suited for such purposes, in which the commercial farming enterprise would facilitate all the functions of the service provider (Ibid: 11, 21).

The Green Scheme Policy was not very specific about the size of irrigation land to be allocated. It proposed that the area farmed by all small-scale irrigators of a specific Green Scheme project be the same in size as the land irrigated by the commercial, core farmer. Referring to the influence of soil, crop and climatic conditions on irrigation outputs, the Policy did not specify the size of land to be allocated to small-scale farmers except to say that such units should range between 3 hectares and 10 hectares (Ibid: 13).

Government, through the Ministry of Agriculture, Water and Forestry committed itself to provide support to Green Scheme farmers. This support would consist of making expertise available to co-ordinate, guide and monitor implementation of the Scheme; provide access to subsidised capital; provide infrastructure developments and facilitate training for small-scale farmers (Ibid).

In 2008 the Green Scheme Policy was revised. The revised Policy reiterates the importance of public-private partnerships in increasing food production for domestic and export markets and broadened the number of models that would qualify for government support under the Green Scheme. These new models have been developed for irrigation in freehold and non-freehold areas (MAWF 2008). The objective of the revised policy continues to ensure agricultural productivity and food security in line with Vision 2030 and the promotion of food self-sufficiency at national and household levels as well as the promotion of research and adaptation technologies to increase productivity (Ibid: 4-5).

Support to irrigation development in non-freehold or communal areas depends on the size of land prospective irrigators wanted to cultivate. Farmers wanting to irrigate more than 30 hecta-

res are classified as private investors. In terms of the Policy this category is not obliged to support small-scale farmers, but will qualify for support regardless of whether they support small-scale farmers or not.

Irrigation farmers wanting to cultivate between 20 hectares and 30 hectares will be assisted through the provision of seeds, fertilisers, pesticides and marketing as per Green Scheme Incentive Brochure. The Green Scheme will not assist farmers intending to irrigate less than 20 hectares. These would be assisted by the National Horticultural Programme (sic) or other support programmes of the ministry (Ibid: 9).[1]

In 2006 the Namibia National Farmers' Union commissioned a short study into the perceptions and views of stakeholders (Rigourd 2006). Amongst other things it argued that the impact of the Green Scheme on poverty alleviation, employment creation and food security at household level was likely to be limited. It raised this point against the background of a decision taken in 2006 to allocate 10ha to small-scale irrigators. More specifically, it stated that the household food security situation of the majority of communal farmers would not be enhanced by the Green Scheme (ibid: 16). However, the review did not come up with specific recommendations on the minimum size of allocations. Instead, it only remarked that 'a more realistic approach is recommended' and that the Green Scheme should not overshadow other development initiatives in communal areas aimed at benefiting the majority of people (Ibid: 35).

It appears that the revised Green Scheme policy did not take up any of the criticisms presented by the NNFU. In fact it narrowed the band of beneficiaries by increasing the minimum land area that would qualify for support under the Green Scheme to 20 ha. The focus of Green Scheme is clearly on the commercial production of high value crops and not on household food security of small-scale farmers. This clearly leaves room for a different kind of small-scale agricultural production that may contribute more directly towards household food security.

2.8 Namibian Millennium Development Goals

The Government of Namibia is a signatory of the Millennium Declaration and is systematically monitoring the Millennium Development Goals (MDGs) within its national and sectoral development framework. It published a report in 2004 setting out the progress made in achieving the eight MDGs (Office of the President 2004b).

The report refers to the Green Scheme and improved access to land through the land reform programme as two initiatives that will help government to achieve MDG 1, viz. eradicating extreme poverty and hunger. These two programmes are aimed at bringing about economic growth as well as a greater distribution of this growth. MDG 7 identifies the promotion of high value-added economic uses of water such as irrigation of high value crops as an opportunity, but sees a challenge in providing incentives to encourage more water efficient irrigation technologies such as drip irrigation in the interest of more efficient water use. Consequently, support to optimise the benefits from water use at national and local levels as well as support to integrated water management at basin/catchment levels are listed as two of four priorities for development assistance to achieve MDG 7.

[1] It was not possible to obtain any clarification on what the National Horticultural Programme referred to. Informants at the NAB were not aware of such a programme.

The eight Millennium Development Goals

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

3 Policy on water quality for horticultural production

The *Theme Report: Water Use and Conservation* which was commissioned by the Namibia Water Resources Management Review (2000a) pointed out that in view of the uneven distribution of potential water sources, the reuse and recycling of water will become increasingly attractive as an alternative source of water particularly because 'it is at a place where wastewater is generated'. With advanced technologies to treat wastewater, it will be cheaper to use such water than to transport water over long distances. Uses of reclaimed water include the irrigation of food crops, fodder, fibre and seed crops and nurseries (Ibid: 34). Based on this and other Theme Reports, the *National Water White Paper* (RoN 2000: 27, 29) proposes to promote the development of new and alternative uses of water through the provision of financial support. The focus will be on the reuse of waste water, rain water harvesting and water recycling. In this regard the need to develop regulations to protect public health and promote safety is necessary. The Water Resources Management Act, 2004 (Act No. 24 of 2004) also encourages the reuse of suitably treated effluent.

3.1 Model Sewerage and Drainage Regulations

In 1996 the *Model Sewerage and Drainage Regulations* were published in the Government Gazette by the then Ministry of Regional and Local Government and Housing to guide local authorities, particularly newly established ones. Regulation 51 set out conditions under which domestic waste water could be used for the irrigation of gardens. Although not spelt out specifically, it must be assumed that such gardens excluded food gardens and referred to ornamental gardens (lawns, flowers etc.). The use of waste water for the irrigation of gardens was subject to permission being granted by a local council and only such water as emanated from showers, baths and the rinsing of laundry was allowed to be diverted for such purpose. These Model Regulations only applied in the event that local councils explicitly adopted them (Namibia Water Resources Management Review 2000b: 13).

Local authorities are entitled by law to regulate matters relating to the use of waste and purified water through specific municipal bye-laws. An investigation into such bye-laws needs to be undertaken in each local authority before water is reused for agricultural purposes.

3.2 Code of Practice: wastewater reuse

CuveWaters intends to promote the reuse of purified waste water for small scale gardening purposes. This reflects an acknowledgement of the fact that such water contains important nutrients for crop production and renders additional fertiliser obsolete. The reuse of waste water also relives increasing pressures on existing water sources. However, unless such reuse is not managed properly, its use poses serious health risks.

In order to address these risks, the Department of Water Affairs and Forestry promulgated a *Code of Practice* related to the reuse of waste water for different purposes in 2010 (DWAF 2010). More specifically, the *Code* discusses reuse of waste water for industrial, agricultural and aquacultural purposes.

The *Code of Conduct* identifies a number of risks and hazards associated with the reuse of waste water. These include, but are not limited to, the following:

- water-borne diseases caused by helminth, bacterial, viral and/or protozoan infections;
- aesthetic issues like smell nuisance or decreased product sales due to consumers not
- wanting to buy products that were produced using wastewater;
- environmental issues including ground water contamination, endangering of marine life
- and pollution of water bodies used for recreational purposes (Ibid: 5)

The *Code* discusses different stages of water treatment in order to recommend the degree of treatment required for specific purposes. With regard to vegetables and crops consumed raw by humans, water must have received tertiary treatment to special standards.[2] Tertiary treatment must include sand and granular activated carbon filtration and disinfection. Any type of irrigation is permitted for such water. It should be added that water that was purified to this special standard can be used for animals (ibid: 15). Vegetables that are not consumed raw by humans can be produced using water that received primary, secondary and tertiary treatment to general standards. However, the *Code* lays down conditions for the irrigation system used. Flood and drip irrigation, for example, will only be permitted if produce is not directly exposed to spray. In addition, effective draining and drying before harvesting is required. Grazing for milk and meat producing animals can only be produced with water purified to general standards. Flood and drip irrigation will be allowed on merit and effective drying and draining is required harvesting (Ibid).

Fruits, cut flowers, crops used for grazing as dry fodder, crops cultivated for seed purposes only, tree plantation and nurseries (cut flowers excluded) can be grown using water drawn from oxidation ponds with 40 day maturation pond. Some restrictions on the type of irrigation used are proposed (Ibid).

[2] 'Where an effluent is treated and reused it shall either adhere to the General or Special Standard, depending on its final application (see Section 4), as per the Water Resources Management Act, 2004 (Act No. 24 of 2004). The General and Special standards are based on the proposed Namibian Water Quality Standards and Guidelines. It should be noted that both the General and the Special standard require a final disinfection step in the treatment process before the water is discharged to the final point of application' (DWAF 2010:12).

Table 5.2. Agricultural Reuse

Irrigation of	Primary and Secondary Ponds	Oxidation Pond with 40 day maturation pond	Primary, Secondary & Tertiary Treatment, not to General Standard	Primary, Secondary & Tertiary Treatment, to General Standard	Primary, Secondary & Tertiary Treatment*, to Special Standard
1. Vegetables and crops consumed raw by humans (3 excluded)	Not permissible	Not permissible	Not permissible	Not permissible	Any type of irrigation permissible
2. Vegetables and crops <u>not</u> consumed raw by humans	Not permissible	Not permissible	Not permissible	- Flood and drip irrigation permissible provided products are not directly exposed to spray - Effective draining and drying before harvesting; - Fallen produce unsuitable for human consumption	Any type of irrigation permissible
3. Fruit trees and vineyards for the cultivation of fruit which is consumed raw by humans	Not permissible	- Flood and drip irrigation permissible on merit provided fruits are not directly exposed to spray; - Effective draining and drying before harvesting - Fallen fruit is unsuitable for human consumption	- Flood and drip irrigation permissible on merit, provided fruits are not directly exposed to spray - Effective draining and drying before harvesting - Fallen fruit is unsuitable for human consumption	- Flood and drip irrigation permissible on merit provided fruits are not directly exposed to spray - Effective draining and drying before harvesting - Fallen fruit is unsuitable for human consumption	Any type of irrigation permissible
4. Cultivation of cut flowers	Not permissible	- Flood and drip irrigation permissible on merit provided flowers are not directly exposed to spray; - Effective draining and drying before harvesting essential	- Flood and drip irrigation permissible on merit provided flowers are not directly exposed to spray; - Effective draining and drying before harvesting essential	- Any type of irrigation permissible - Effective draining and drying before harvesting essential	Any type of irrigation permissible
5. Grazing for milk or meat producing animals	Not permissible	Not permissible	Not permissible	- Flood and drip irrigation permissible on merit; - Not Permissible as drinking water for animals - Effective draining and drying before consumption	- Any type of irrigation permissible; - Permissible as drinking water for animals.
6. - Crops not for grazing, but utilized as dry fodder; - Crops cultivated for seeds purpose only; - Tree plantations; - Nurseries (cut flower excluded, see 4)	Not permissible	- Any type of irrigation permissible on its merits - No over-irrigating or pool forming - No smell nuisance - Properly fenced (no public allowed) - No meat animals, milk producing animals or poultry permissible	- Any type of irrigation permissible on its merits - No over-irrigating or pool forming - No smell nuisance - Properly fenced (no public allowed) - No meat animals, milk producing animals or poultry permissible	Any type of irrigation permissible	Any type of irrigation permissible
		-	-		

*** Sand <u>and</u> Granular Activated Carbon Filtration <u>and</u> Disinfection <u>must</u> form part of the Tertiary Treatment steps.**

4 Current small-scale gardening projects

Initiatives that promote small-scale gardening are not well documented. With the exception of the *Integrated Initiative in support of urban and peri-urban horticulture development* which is implemented by the Ministry of Agriculture Water and Forestry, all other small-scale horticulture projects are implemented by NGOs. The Ondangwa based NGO, Creative Enterprise Solutions[3], for example, supports small-scale drip irrigated production of vegetables in parts of the north-central regions and Kavango Region. A detailed assessment of the extent of small-scale horticultural production was beyond the scope of this assignment. However, such an exercise may yield important insights that may reduce the risk of failure of new gardens.

Small-scale drip irrigation, Rundu urban 2011

4.1 Integrated initiative in support of urban and peri-urban horticulture development

This initiative of the Ministry of Agriculture Water and Forestry is aimed at supporting individual households in their efforts to improve household food security. At the same time it is potentially preparing people for participation in the Green Scheme by introducing them to irrigated horticultural production. The project mission is stated as

- contributing to food security by improving access to high quality fresh horticulture produce at household level all year round; and
- promoting employment and income for the less endowed population in the urban and peri-urban environment.

The project targets 'urban slum dwellers', landless, marginal farmers and disadvantaged groups, resource poor families and unemployed and underemployed people.

The MAWF provides support to people who have shown an interest to start small scale gardening and requested support. Although production happens on land belonging to individual house-

[3] Creative Enterprise Solutions, P. O. Box 15314, Oluno-Ondangwa, info@ces.org.na, www.ces.org.na

holds, support which consists mainly of training is only provided to groups of interested people. Currently most of the groups live in urban or peri-urban areas across the country. The programme was piloted in Windhoek and Rundu, but currently supports people in urban areas such as Oshakati, Ondangwa, Rundu, Windhoek and Aranos. While the focus of on urban and peri-urban areas, the MAWF will also support similar initiatives in rural areas. According to the programme co-ordinator in the MAWF, requests for support are increasing constantly, although the number of people engaging in urban and peri-urban horticulture with the support of MAWF (Ms. Shilunga, pers. comm. 28.3.2011). The ministry has committed N$3 million to the project.

Participation in the programme hinges on two basic questions: who owns the land, and who pays for the water. This is to ensure that gardens are started on land with clear use rights to avoid conflicts at harvest time. Backyard gardens of private residential areas are therefore preferred to open public places. The second question is aimed at ensuring that water is available for gardening. The majority of people involved in the programme make use of piped, i.e. drinking water which has to be paid for.

Typically, the programme starts with organised groups of people who want to engage in food production. Such groups include soup kitchens, orphans and HIV/AIDS patients. The project provides each participant with a training kit. This includes some seeds and basic implements to enable people to start gardening. But the most important component is training. The programme co-ordinator, who is based in Windhoek, provides training to Agricultural Extension Technicians (AETs) at Agricultural Development Centres (ADCs). They are in turn expected to train participants and provide ongoing support. Before they are asked to do so, however, the AETs are required to establish small gardens at their respective ADCs. The main reason for doing so is to adapt gardening techniques to specific local conditions. Training of participants takes place at the ADCs, where trainees are able to see what it involves to engage in small-scale horticultural production.

The programme does not prescribe the crops people have to grow and leaves that decision to each participant. The primary aim is to improve household food security by providing vegetables, but if participants are allowed to sell their surplus.

Although training kits are provided only once at the start of training, the MAWF will consider subsequent support of people who have shown dedication. Where initial interest wanes, the MAWF simply withdraws its support. The rate of attrition can be high. The co-ordinator mentioned a youth group that started with 23 participants of which only 3 continued production after a short period.

There is no official policy framework to guide urban horticulture generally and this programme in particular. Growing requests of support for urban and peri-urban agriculture suggests that there is a need to expand the programme. This required additional financial resources and staff. The programme is presently co-ordinated by one person in Windhoek.

4.2 Finance

Mwinga (2010) has pointed out that agricultural production requires labour, land and capital. More specifically, small-scale and urban and peri-urban gardening depend of the availability of water – either by paying for tap water or by using alternative sources such as harvested rainwater. With regard to the former, infrastructural costs to deliver potable water to communities are considered to be sunk costs. The consumer pays only for the costs of delivering water to the home or community. As far as rainwater harvesting is concerned, the current situation is that

individual households will have to provide the capital to develop appropriate infrastructure. The state is not yet involved in providing any financial support towards this.

Jokisch et al (2010) have provided a comprehensive analysis of the costs involved in establishing different rainwater harvesting technologies and different types of gardens. This indicates that substantial amounts of money will be required by individual households to establish similar catchments. It must be assumed that many interested households will need credit to finance such developments, unless the state provides subsidies. However, access to finance remains an obstacle.

According to Fiebiger et al (2010: 26-27) only Agribank offers agricultural credit at subsidised interest rates to communal farmers. For loans exceeding N$5.000 the Bank requires collateral, which is difficult for the majority of communal farmers, as they do not own their land or have alternative collateral such as property in urban areas or insurance policies. The lack of appropriate collateral is also the main reason why many communal farmers find it impossible to obtain loans from normal commercial banks.

The only micro-finance institution operating in Namibia is Fides Bank. At present it only serves customers in the north-central regions. However, it does not provide micro finance to farmers, as it regards the sector as too risky (Cardno 2010: 68, 70).

Focusing on urban and peri-urban agriculture, Mwinga (2010) was optimistic that financial institutions were likely to increase lending to small-scale agricultural operations in urban and peri-urban areas ‘partly because of acceptable and quality security, and the fact that production takes place around the town close to the market and therefore the risks are minimised’. Moreover, produce from such operations could be delivered quickly to markets, thus ensuring its freshness. This optimism has yet to turn into reality.

Financial problems are compounded by the fact that the MAWF does not have enough suitably qualified extension technicians to support horticultural production. The majority of Agricultural Extension Technicians are trained in staple crop and livestock production (Fiebiger et al 2010: 25).

5 Conclusion

Namibia has a comprehensive policy framework to promote household food security. Most policies call for diversification of agricultural production and appropriate, small-scale production methods in irrigation. However, few attempts – if any – have been made in that direction. The emphasis of several donor and government funded programmes has been on improving the productivity and yields of dry land farming as well as introducing small-scale irrigation on large irrigation projects. Such interventions are concerned with the improvement of land use patterns and changed farming practices to bring about enhanced food security through improved yields.

With regard to irrigation, current policies are aimed at the commercial production of high value crops. Where large-scale irrigation is involved such as the Green Scheme, this seems perfectly legitimate. However, the vast majority of poor households in the rural areas are not likely to derive direct benefits from the Green Scheme. Consequently, as the NNFU has argued, the impact of the Green Scheme on improving household food security of these households is likely to be negligible (Rigourd 2006: 35).

Despite the political rhetoric about improved household food security, the current political framework does not specifically target small-scale food producers at the local level. The current review bears out Mwinga’s (2010) argument ‘that currently urban agriculture has no legal back-

ing which can be used as guideline for both urban farmers and relevant institutions although some pieces of legislation might have an indirect on urban agriculture (sic)'. Consequently, those farmers, and they will remain the vast majority for a long time to come, who cultivate less than 20 ha – the minimum provided for under the Green Scheme – are not receiving any support.

At the same time, the policy framework does not preclude the development of small-scale gardening both for home consumption and the market. Moreover, current policies and legislation not only encourage the use of alternative water sources – and specifically the reuse of purified water – but regulations exist that indicate the level of purification required for different crops.

It is recommended that a concerted is made to encourage a review of the current policy framework with a view to provide more focus on small-scale food production in urban, per-urban and rural areas. This will require discussions with politicians and policy makers at the highest political level. The review should not lose sight of food producers who cultivate less than 20 ha, which is the minimum area supported by the Green Scheme. Food producers in this category are found along Olushandja Dam in Omusati Region, for example. This policy review also needs to address institutional mandates and responsibilities in order to provide the appropriate regulation of and support for small-scale food production, particularly in urban and peri-urban areas. A proper policy and legal framework is not only necessary to intensify small-scale food production, but is also required to provide appropriate technical support and advice (Dima et al 2002: 82).

Simultaneously, CuveWaters should engage Regional Councils on issues relating so small-scale food production within the context of the regional Food Security and Nutrition Action Plans. It is conceivable that this may receive support from planners and Regional Councillors.

Local authorities will also have to assume more responsibilities in this regard. Currently, they are entitled to make bye-laws on issues that impact on the management of local authority areas. Such bye-laws may differ between different local authority areas. It was not possible within the scope of this assignment to study municipal bye-laws of local authorities in the north-central regions to establish whether they contained any stipulations with regard to the establishment of urban and peri-urban vegetable gardens and the use of purified waste water. This will be a necessary step.

At the same time, the promotion of small-scale gardening using a resource mix will require a concerted campaign at all levels of government and the target population to explain the potential importance and benefits of this approach. V2030 and a number of sectoral policies emphasise the importance of using water more efficiently and encourage the reuse of water. The rolling out of the approach requires careful planning so that access to inputs, markets and extension services are in place. Gardens should be operated by individuals for their own gain and not as collective production units. Experience has shown that many projects that promoted communal production with donor money collapsed as soon as these projects and consequently donor funding came to an end.

For the approach to succeed, intensive community consultations and support will be necessary. In this regard the issue of rain water harvesting is less controversial as the reuse of water for agricultural purposes. Introducing the latter will require a well-developed public awareness campaign to allay existing fears about potential negative health impacts and to counter possible prejudices.

6 Appendix 1: Summarising matrix

Policy	Aims / Objectives	Strategy	Target	Status	Potential	Constraints
World Food Summit Plan 1996	Reduce number of undernourished people worldwide by half by 2015	Create an enabling environment for achieving sustainable food security for all and implement policies aimed at eradicating poverty and inequality by pursuing participatory and sustainable policies and practices for rural and agricultural development practices	Global and national	MAWF regularly reviews progress	Targeting particularly the poor Provides international political support for small-scale gardening	
Namibian Millennium Development Goals	MDG 1: Eradicate extreme poverty and hunger MDG 7: Ensure environmental sustainability	MDG 1: implement Green Scheme; improve access to land through land reform programme MDG 7: provide incentives to encourage more efficient irrigation technologies in the interest of more efficient water use and provide support to optimise benefits from water use at local regional and national levels through IWRM	National food security and economic development. MDG 1 targets commercial irrigation for farmers irrigating more than 20 ha	Targets reviewed regularly	Increase food production by encouraging more efficient irrigation practices. Encourages more efficient water use which would encourage a resource mix	Appears to focus on irrigated commercial agriculture Green Scheme supports farmers with access to more than 20ha of land for irrigation Focuses on conventional water sources
V2030 / NDP 3	By 2030 Namibia will be a prosperous and industrialised country and poverty will be reduced to a minimum and the population of Namibia is food secure	Improve levels of food security at household and national levels by improving crop and horticultural production; Promote alternative crops but discourage unsuitable cash crops Promote high value added crops such as dates and grapes	National and regional Urban and rural poverty reduction is a main priority	As a long term vision, V2030 not up for review. NDPs are reviewed and new ones developed every five years	Encourages crop diversification Promotes sustainable, equitable and efficient water use	Focus on high value-added crops

Policy	Aims / Objectives	Strategy	Target	Status	Potential	Constraints
Food and Nutrition Policy	Improve individual and households food security	Provide access to adequate resources to grow or purchase necessary food commodities Provide access to appropriate services such as safe water, health facilities and reliable markets Produce regional Food Security and Nutrition Action Plans in a participatory manner	Food insecure households and individuals in urban and rural areas	In force since 1995. Regional Food Security and Nutrition Action Plans are in place covering the period 2006-2015	Promote small-scale food production at regional level in close co-operation with Regional Councils	Regional Food Security and Nutrition Action Plans appear not to have had any impact Current plans do not mention small-scale food production and options for alternative water sources
National Agriculture Policy	To sustain and increase agricultural levels of production, real farm incomes and as well as food security at national and household level	With regard to food production: implementation of irrigation projects that are economically viable, technically feasible and environmentally sustainable Promote low cost small-scale irrigation using appropriate technology	Farmers in general but small-scale communal farmers in particular	In force since 1995. A review appears to be ongoing.	Introducing small-scale and cost-effective irrigation techniques Developing a resource mix including rain water harvesting	Urban horticulture appears to be excluded from the strategies of the NAP
Poverty Reduction Strategy (PRS) / Poverty Reduction Action Programme (PRAP)	To reduce poverty by improving equitable access to public services, accelerating agricultural development and developing options for non-agricultural empowerment	With regard to agricultural development: increase productivity and encourage diversification of crops together with the further development of the livestock sector Development of a Poverty Reduction Action Programme developed in 1998	Urban and rural poor at all levels	PRS approved in 1998 is still in force Poverty Reduction Action Programme was developed in 1998 for a 5 year period and not renewed	Due to poor agricultural resource base the PRS envisioned only short-term gains from improved agricultural productivity	No specific mention of small-scale food production PRAP projects concentrated on non-agricultural actions

Policy	Aims / Objectives	Strategy	Target	Status	Potential	Constraints
National Horticulture Initiative	To enhance the quality of horticultural produce while increasing economic development and employment as well as food security and self-sufficiency among national communities employment creation	Investigate feasibility of developing infrastructure for marketing horticultural produce in Namibia Improve access of local horticultural producers to local market through Namibian Horticulture Market Share Promotion Scheme Introduce import control permits to encourage local production	Horticultural producers primarily in the commercial farming sector	Initiative is ongoing	Possibility to lobby for the inclusion of small-scale food producers (urban, peri-urban and in villages) in the Initiative to obtain support	Small-scale food production primarily for own consumption not included in the Initiative
Green Scheme	To increase local food production in order to obtain food security and self-sufficiency	Primary focus: establish commercially viable irrigation schemes on communal land on an out grower basis based on strong public-private partnerships	Green Scheme intends to provide support to individual commercial irrigators	Ongoing. Initial Green Scheme Policy was revised in 2008 to widen the number of models which the programme would support	No potential for small-scale food production as the Green Scheme is expected to be commercially viable	Caters only for irrigation farmers who produce food on more than 20 ha.
Code of Practice for water reuse	To regulate the reuse of purified waste water		Users of purified waste water at local, regional and national level	Guidelines are subject to ongoing revisions		

7 Appendix 2: Previous small-scale horticultural programmes

Namibia has seen many localised horticultural production initiatives across the country since long before Independence. It is true to say that most have been unmitigated failures. Regrettably, documentation on these initiatives is very difficult to find, if it exists at all. It is therefore not possible to obtain an impression of why so many of these projects have failed. The Northern Namibia Rural Development Project is an exception in that it produced several reports on the topic. The reason for providing this brief annotation is that too many initiatives are started without attempting to find out what went before, whether it succeeded or failed and what the reasons were for both. A critical analysis of the experiences with small-scale gardens in the past is likely to improve the design and implementation of new initiatives. Regrettably, this hardly ever happens.

By reviewing some these reports it is not suggested that there have not been other, and even successful, small scale horticulture projects. This includes a number of individuals who are practicing urban horticulture profitably, some using tap water in Windhoek. However, documentation on these is hard to come by, as the example of the *Integrated Initiative in support of urban and peri-urban horticulture development* project of the MAWF has shown.

7.1 Northern Namibia Rural Development Project

The Northern Namibia Rural development Project was a joint project of the Ministry of Agriculture, Water and Rural Development and the French Ministry of Development Co-operation. In 1994 the programme started to work with a group of 27 returnees who set up a collective garden at Olushandja dam. Several other gardening projects were supported through the programme and several short reports were produced covering various aspects of small-scale gardening experiences in the north-central regions. While the economic data is out-dated, the reports contain information that may still be relevant and useful for new gardening projects.

This section provides a very brief annotated description of some of these reports.

1. D. Poulet: *Sustainability of vegetable gardening in the Central-North of Namibia* (1995)

This study begins with a brief description of small scale gardening practices in the north-central regions. This includes an estimation of potential outputs of the main crops cultivated in vegetable gardens as well as the costs of production and selling prices. Water was found to be the single highest cost factor in vegetable gardening, constituting 60 per cent to 80 per cent of running costs (Poulet 1995: 16). Prices for purified water and water from the canal were included. The price of the former was almost 3 times higher than water from the canal (ibid: 17).

A final section presents an economic analysis of different types of gardens, i.e. specific case studies. The author points out that he was not presenting an in-depth economic analysis of different gardens, but rather an evaluation of their viability.

Conclusions from the analysis include the following:

- Small-scale vegetable gardening is faced with specific challenges. These include the lack of experience in vegetable production and limited access to information regarding gardening.
- Soils are generally of poor fertility
- Markets are poorly developed

- Inputs and equipment are not easily accessed
- Lack of access to credit. (ibid: 46)

Against this there were positive factors for vegetable production. The climate allowed production virtually throughout the year. Road infrastructure was well developed and the supply of water was regarded as reliable and cheap. However, the economic analysis has shown that developing gardens by using potable water for irrigation was not viable. Viability only became possible if gardens were very productive or if the area cultivated was small. The author also drew attention to the finding that one hectare of irrigated garden required approximately $50m^2$ of water per day, which represented the daily water requirement of 2.000 people assuming a minimum daily consumption of 25 litres per person and day in dry areas (Ibid: 46-47).

Another finding was that gardens that were started by individuals had the best chances of success. The author warned that 'assistance leads to mismanagement of equipment, which once it becomes old, indicates the end of the project' (Ibid: 47).

Access to implements and equipment was difficult because of the small supply market. Increased demand and access to credit might improve this. Fertility management played a major role in gardening and should not be neglected.

Selling produce constituted a major problem for vegetable growers. The author recommended that 'producers have to organise the market and to define their target market' (Ibid: 47).

The social sustainability of vegetable gardening depended on economic profitability. People, and especially young people, would only engage in vegetable gardening if the opportunity costs of doing so was higher in other areas.

Finally, the author concluded by stating that 'vegetable gardening in suburb areas (sic) constitutes a non-negligible potential' (Ibid: 48).

2. B.-T. Ly: *Horticulture in the central-north of Namibia* (1996)

This study has taken the study of Poulet and added new and/or different information to it. Ly develops the typology of vegetable farmers and provides useable agricultural areas per labourer for each group as well as the estimated Net Value added per labourer per month (Ibid: 60-10).

Under the heading 'Does the irrigated horticulture feed the producer?' Ly refines the concepts of *survival threshold* and *reproduction threshold*. The former refers 'to the minimum income per year (or month) which enables an active person to feed, to treat (sic), to clothe decently and to house himself'. This corresponds closely to the *cost of basic needs* approach adopted by the National Planning Commission as an indicator for poverty assessments.

Reproduction threshold on the other hand refers to the minimum amount a person needs to ensure the reproduction of his farm and is additional to the survival threshold (Ibid: 11).

These two concepts are then used to analyse the sustainability of each type of vegetable garden and the opportunity costs (Ibid: 12).

While the data presented in the economic analyses is outdated, the advantages and constraints of vegetable farming in the north-central regions presented by Ly may still be valid. His ideas on how the advantages of small-scale horticultural production could be strengthened and constraints reduced may also still be relevant.

3. D. Helmstetter: *Gardening around Olushandja Dam* – Omusati Region (1995)

Helmstetter introduces his short paper by stating that only few vegetable gardens have succeeded in the north-central regions. The reasons he cites for this failure include bad designs (use of expensive purified water; collective management without clear regulations; a charity oriented approach) and mis-investments. Based on the experience of the Epalela Vegetable Producers Association which was supported by the Northern Namibia Rural Development Project, Helmstetter concluded that small-scale vegetable gardening 'can be very profitable if properly set up – without useless investments and with emphasis put on individual responsibility and on proper management' (Ibid: 2).

However, the prospects of these gardens were threatened by increased costs for water that followed from the establishment of Namwater (Ibid: 2; 6). In view of this Helmstetter argued that the idea of subsidising water for small-scale gardening should not be ignored. He reminded the reader that agricultural subsidies were part and parcel of agricultural production in the developed world and that they were an important tool to implement policy. Support for small-scale gardening in Omusati was a realistic policy (Ibid: 9).

In conclusion, Helmstetter stated that 'gross products of up to N$100.000 per hectare could be achieved with a relatively small initial investment of N$20.000. In the Epalea case 75 per cent of the initial productive investment consisted of a grant made by the French Co-operation (Ibid: 3). A policy balancing the water needs of human beings and livestock and the interests of horticultural development was urgently needed (Ibid: 11).

4. D. Helmstetter: *The Epalela Vegetable Producers Association* (1996)

This short report discusses the sociological and economic aspects of a collective gardening project at Olushandja dam. The project was started in 1994 by a group of returnees.

The garden experienced several problems ranging from poor use of equipment, poor living conditions and marketing problems to a lack of proper fencing and the absence of pest control. However, the major problem appeared to have been a management issue related to collective management of the garden. Producers agreed that private management of individual garden plots might improve the problem. Subsequently, each member was allocated hi/her own plot and produced to sell for own benefit (Ibid: 5-6). The switch-over has several positive impacts: the utilised garden area increased dramatically, opportunists who were only motivated by 'fund-raising' left the scheme when they realised that incomes had to be generated through individual hard work and species grown switched to vegetables where a local marketing opportunity existed. In short, the individual production approach saw 'a kind of entrepreneurial spirit...emerging) (ibid: 7). These experiences suggested strongly that collective gardening was not viable (Ibid: 11).

Some lessons drawn from Epalela:

- Appropriate methods are needed to start gardening: as soon as donor subsidies are involved, a project will attract people who are not motivated by the opportunity to produce but rather by access to easy money. The author recommended 'a long screening process' with joint design and long talks being possible tools.
- Step by step implementation of subsidies will enable project managers to link the later to achievements made by producers. In this way opportunists will be weeded out. Access to money should not be too easy in order to weed out opportunists who only join to 'raise funds'. Such a process needs time, up to 5 years to set up gardens properly (Ibid: 10, 16).

- Motivating producers is more important in setting up gardens than technical aspects. 'Any support concentrating only on technique has a great chance to be ineffective'.
- A charity oriented approach to gardening is counterproductive. A clear difference should be made between charity oriented gardening (which includes homestead production) and marker oriented gardening.
- Finally: the failures of small scale gardens should not lead to wrong conclusions. Failures were the result of wrong designs and approaches (Ibid: 11).

The second section of the paper discusses technical and economic issues related to small-scale gardening at Epalela. More specifically, it provides information on how much of specific vegetables a garden can produce in Omusati Region and what the potential gross product is. Cost to develop and run a garden are also provided (Ibid: 12-15). And finally, the study identifies some constraints for establishing small-scale gardens. Three main issues stood out: the wrong approach to horticultural production; marketing problems, the supply of inputs and a lack of technical information on vegetable production (Ibid: 16-17).

7.2 Rural Development Support Programme for the Northern Communal Areas (1995-1998)

The Rural Development Support Programme was supported by the EU and ran from 1995-1998. The specific objectives of the project were to enhance the productivity of food crops and improve labour productivity in the Northern Communal Areas (Agrisystems 1996: 1).The project commission a study into *Options for cash crop production in the Northern Communal Areas* (Ibid). One chapter of this study is devoted to horticultural production.

The chapter starts with a statement that previous gardening projects were heavily subsidised: costs of irrigation systems were generally written off. In most cases producers did not put in any equity. Agrisystems (1996: 33-34) argued that 'from a production point of view, virtually all these gardens have been an unmitigated disaster. Yields have been very low, pest and disease control has been virtually non-existence (sic) and there has been little attempt to grow crops in the season for which they are best adapted'. In addition, subsidised production distorted the market and disadvantaged true entrepreneurs from getting involved in horticultural production. Marketing help has discouraged traders to buy from growers and transport produce to urban markets.

The northern communal areas suffered from specific constraints with regard to horticultural production. These included a climate that was unsuitable for several horticultural products and high sand content in soils leading to low water retention capacities and increased leaching. This required effective and well controlled irrigation systems to attain good yields. Moreover, low soil fertility implies high fertiliser rates and the application of trace elements to get good yields. On the other hand, it also had low levels of pests and disease, which made the north-central regions a good place for horticultural production. Generally yields and the quality of food and vegetables grown were poor (ibid: 35-36).

Markets were an issue. The single biggest problem in marketing of produce is transport. Local production will obviate this problem as local means of transport can be used such as donkey carts. But that depended on the availability of water. In the mid-1990s the use of waste water for local production was not very common, and the consultants surmised that this source of water may become increasingly important for horticultural production. They advised the Rural Development Support Programme to assess the sustainability of promoting this sector (Ibid: 37).

A section of the chapter analyses gross margins and revenues for 5 common vegetables. This demonstrated ‘that well grown crops of horticultural crops (sic) can produce attractive gross margins.’ However, these are not often achieved primarily on account of insufficient management skills (Ibid: 41-42).

The following section provides observations on the opportunities for 27 specific fruit and vegetables (Ibid: 42-46).

The chapter concludes with a number of recommendations aimed at expanding and improving horticultural production in the north-central regions. These include the recommendation that home production of certain fruits and vegetables be encouraged. More specifically, the consultants recommended that home production of mangoes and possibly date palms be encouraged as well as the making use of waste water for the production of vegetables on small areas. This would be more cost effective than larger irrigation projects (Ibid: 48).

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