

# Women stand to profit from a new look at indigenous vegetables

RIU

## Validated RNRRS Output.

A new focus on indigenous vegetables has helped to highlight their strategic food security role, offering important opportunities for the poor—particularly women—who farm, process and trade them. Until recently, these vegetables were viewed as minor crops with little economic importance, and therefore were overlooked by research in Africa. This meant that next to nothing was known about their productive potential, economic value or contribution to household nutrition and livelihoods. A workshop in 1997 helped to reverse this situation, identifying important species and priorities for research. Now, new methods for participatory selection are helping to produce improved varieties in Ghana and Zimbabwe, and information leaflets in local languages have been distributed to farmers, NGOs and government departments.

Project Ref: **CPH29:**

Topic: **5. Rural Development Boosters: Improved Marketing, Processing & Storage**

Lead Organisation: **Natural Resources Institute (NRI), UK**

Source: **Crop Post Harvest Programme**

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## Description

**CPH29**

## Research into Use

NR International  
Park House  
Bradbourne Lane  
Aylesford  
Kent  
ME20 6SN  
UK

## Geographical regions included:

[Cameroon](#), [Ghana](#),  
[Tanzania](#), [Zimbabwe](#),

## Target Audiences for this content:

[Crop farmers](#), [Processors](#),

**A. Description of the research output(s)**

1. Working title of output or cluster of outputs.

*In addition, you are free to suggest a shorter more imaginative working title/acronym of 20 words or less.*

**Improving the livelihoods of vegetable growers and processors through market promotion of fresh and processed indigenous vegetables**

2. Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.

**Crop Post Harvest Programme**

3. Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities. As with the question above, this is primarily to allow for the legacy of the RNRRS to be acknowledged during the RIUP activities.

**R6964: Opportunities and constraints in the commercialisation of indigenous vegetable in E & W Africa**

Cameroon: University of Dschang, Dschang.  
 Institut de Recherche Agricole pour le Développement, Buea.  
 International Institute for Tropical Agriculture - Humid Forest Station, Yaoundé.

Uganda Makerere University, Kampala.  
 Kawanda Agricultural Research Institute, Kampala.

UK Natural Resources Institute, University of Greenwich, UK.

**R 7487: Improving the livelihoods of peri-urban vegetable growers through market promotion of fresh and processed indigenous vegetables**

The research project, undertaken in Zimbabwe, was co-ordinated jointly by John Orchard (NRI) and Fabeon Chigumira Ngwerume (HRI), with the following partners:

John Orchard (Contact person) Natural Resources Institute, University of  
 Greenwich, UK. 44 634 883741; j.e.  
 orchard@gre.ac.uk

Fabeon Chigumira Ngwerume, Ben Horticulture Research Institute, Marondera  
 Mvere, Edwin Marongwe, Samson  
 Muswere

Mr. E. Gwenero, Ms. B. Dube, Mr. D. Bhebhe, Mr. A. Mutyavaviri

AGRITEX- Matebeleland North-Bulawayo

Rosalia Madamba

Department of Research and Specialist Services. Crop Breeding Institute.

Langton Mukwereza

Agricultural Management Services  
Department of Agricultural Research and Extension (AREX)

Norman Mhazo, Raymond Nazare

Development Technology Centre, University of Zimbabwe

E. Mutimutema

AGRITEX, Mutare

Rudy Schippers

Horticulture Development Services Ltd.

**R6630: Integrated Food Crops Systems Project: Enhancing Smallholder Livelihoods through Reducing Costs and Adding Value to Agricultural Production.**

This research project was managed by J Orchard (Contact person, NRI) and V Suglo Ministry of Food and Agriculture, Regional Office, Brong Ahafo, Ghana. Other collaborating Ghanaian institutions included:

- CSIR Institutes: Crop Research Institute and Plant Genetic Resources Centre;
- Wenchi Farming Research Institute;
- Department of Agricultural Extension Services.

**4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced? (max. 400 words).**

*This requires a clear and concise description of the output(s) and the problem the output(s) aimed to address.*

*Please incorporate and highlight (in bold) key words that would/could be used to select your output when held in a database.*

*Integrate approach*

**Indigenous vegetables** (IVs) have a strategic food security role, offering significant opportunities for the poor, particularly women, through farming, processing and trading activities. Until recently, these commodities were viewed as minor crops of little economic importance, and therefore had not been a focus for research in Africa. Little is known of their productive potential, economic value and contribution to household nutrition and livelihoods, and in relation to extracted products for nutritional and medicinal use. In addition, IVs are a resource that is being subject to habitat and **genetic erosion**, with loss of **local knowledge**.

Following a strategy paper to determine their significance an all-Africa workshop in 1997 identified important species and priorities for research, particularly the need to fully understand production, handling and marketing. This guided subsequent diagnostic studies (R6964) on the **opportunities and constraints to**

**commercialisation** in Uganda and Cameroon which determined that:

- IVs offered a significant opportunity for the poorest people, particularly women, to earn a living, as producers, processors and traders, without requiring large capital investments;
- prices are relatively affordable compared with other food items;
- IVs provide an important source of employment for those outside the formal sector;
- revenue is dependent on improvements to germplasm, agronomic practices, pest and disease control and market and post-harvest management.

These constraints were addressed in research projects in Ghana (1996 – 99) and Zimbabwe (1999 – 2003), which aimed to improve the livelihoods of **peri-urban** vegetable growers through **market promotion** of fresh and **processed indigenous vegetables**.

Outputs from the project were:

**Methodology:** **participatory varietal selection** to produce new varieties involving farmers, traders, scientists and dissemination organisations in planning and execution, particularly by farmers and traders to validate the research through identifying crop desirable characteristics and in varietal selection for both on-station and on-farm trials.

**Technology:**

- development of **on-farm varietal line purification** systems to enhance farmers' germplasm;
- **garden egg** plant varieties with improved characteristics and yield;
- **improved nursery practices** increase yields for Corchorus (nine-fold) and Cleome (two-fold);
- **modified harvesting practices** increase yield of leafy vegetables threefold and their seed yield (seven-fold);
- simple **post-harvest practices** such as cold storage and correct harvest date improves quality and marketability;
- **sun drying technology** to increase returns;
- **improved seed** of **Cleome, Corchorus, Brassicas, Okra** and **Cowpea**.

**Awareness raising** – publication of book and CD-ROM - Schippers, R. R., (2000). African indigenous vegetables. An overview of the cultivated species.

5. What is the type of output(s) being described here?

Please tick one or more of the following options.

<b>Product</b>	<b>Technology</b>	<b>Service</b>	<b>Process or Methodology</b>	<b>Policy</b>	<b>Other Please specify</b>
X	X		X		

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities, if so, please comment

The projects covered the following commodities: garden egg, cowpea (bean and leaf), bottle gourd, Corchorus and Cleome (spider plant). However, the approaches and methodologies used could apply to all vegetables.

7. What production system(s) does/could the output(s) focus upon?

Please tick one or more of the following options. Leave blank if not applicable

Semi-Arid	High potential	Hillsides	Forest-Agriculture	Peri-urban	Land water	Tropical moist forest	Cross-cutting
X		X	X	X		X	

8. What farming system(s) does the output(s) focus upon?

Please tick one or more of the following options (see Annex B for definitions).

Leave blank if not applicable

Smallholder rainfed humid	Irrigated	Wetland rice based	Smallholder rainfed highland	Smallholder rainfed dry/cold	Dualistic	Coastal artisanal fishing
X	X		X	X		

9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this output with research outputs from other sources (RNRRS and non RNRRS)? (**max. 300 words**).

Please specify what other outputs your output(s) could be clustered. At this point you should make reference to the circulated list of RNRRS outputs for which proformas are currently being prepared.

**Improving access to and benefit sharing from local knowledge and (agro)-biodiversity:** IVs play a strategic role in the livelihoods of women and men. Enhancing their future role will involve a range of stakeholders in processes which should ensure both improved access and benefit sharing with respect to local knowledge and biodiversity. Use should be made of the project “Gender, Biodiversity and Local Knowledge to Strengthen Agricultural and Rural Development” (LinKS project), implemented in Tanzania, Zimbabwe, Mozambique and Swaziland which explored linkages among local knowledge systems, gender roles/relationships, food provision, and the conservation and management of agro-biodiversity.

**Pest and disease management:** There is a need to develop and validate pest and disease control strategies making use of projects such as ‘Pest management in horticulture crops: an integrated approach’ (R7403) and ‘Integrated pest management through improved training manuals’ (R8471, R8341).

**Participatory plant breeding, varietal selection and seed management:** A number of initiatives have strengthened the role of farmers in varietal development, including Ghana Participatory cassava breeding (R8406) and rice varietal selection (R7657). The Good Seed Initiative improved farmers’ seed management (R8480) and R8312 targeted production of kale seed in Kenya.

**Improving pro-poor supply chains:** Little work has been undertaken on understanding and managing the

supply chains of indigenous vegetables. Systems and tools that have been developed by other projects in integrated supply chain management should be examined for their applicability for national marketing of IVs:

- Management & Control - Continued access by small-scale growers to EU fresh produce markets (R8431);
- Improved quality assurance systems for fresh fruit and vegetables produced by resource poor farmers (R7528);

**Market information systems** developed by the following projects could assist in this area including Decentralised Market Information Service in Lira District, Uganda (R8250); Making informed choices: facilitating farmers' enterprise selection processes in Uganda (R8421);

## Validation

### **B. Validation of the research output(s)**

#### **10. How were the output(s) validated and who validated them?**

*Please provide brief description of method(s) used and consider application, replication, adaptation and/or adoption in the context of any partner organisation and user groups involved. In addressing the "who" component detail which group(s) did the validation e.g. end users, intermediary organisation, government department, aid organisation, private company etc... This section should also be used to detail, if applicable, to which social group, gender, income category the validation was applied and any increases in productivity observed during validation (max. 500 words).*

In Ghana, validation of the vegetable improvement programme was integrated into the project by active involvement of the end-users of the outputs i.e. farmers and traders. This was crucial because varietal selection is particularly difficult in highly heterogeneous environments where smallholders have a range of preferences. To address this issue, the Project involved, from an early stage, farmers, traders, scientists and those involved in promotion and uptake in the following way:

- selection of farmers (mixture of male and female) with support from local extension officers who had contacts with end-users, and the selection of traders (mostly female) who visited the farmers' villages and who understood the market needs (this was supported by a wider survey of farmers and traders to identify their perceptions of quality and marketability characteristics);
- development of criteria by the above end-users and researchers to allow appropriate selection of germplasm with the desired characteristics;
- selection of plants from the farmers' fields by farmers and researchers for the varietal improvement programme;
- completion of a series of on-station purification and selection trials with farmers and traders leading

the selection team – enumerators accompanied the farmers and traders during data collection using two recording formats, a check list aimed at collecting specified information and the other, an open recording sheet allowing free comments from farmers as they passed by each of the garden egg lines;

- final on-farm trials run wholly by the farmers, with support from extension agents, where farmers made their own selections of desirable varieties.

The above approach can be used in any vegetable improvement programme particularly where the source of genetic diversity resides with farmers, which is typical of those engaged in cultivation of indigenous crops.

In Zimbabwe, most of the research undertaken was more strategic in nature which aimed to understand some of the fundamental approaches required to improve yield through improved nursery, agronomic and harvesting practices. More adaptive research was undertaken in the development of solar drying technologies for preserving indigenous leafy crops. This was undertaken through on-farm trials so that the farmers/processors could validate the processing technology and the dried products from the solar dryers.

## Current Situation

### C. Current situation

#### 12. **How and by whom** are the outputs currently being used? Please give a brief description (**max. 250 words**).

In both Ghana and Zimbabwe information leaflets (in local languages) have been distributed to farmers and farmers' organisations, NGOs and government departments, including extension agencies.

In Ghana, garden egg germplasm and the methodology for participatory varietal selection was deposited with the Crops Research Institute which has continued the breeding programme to develop improved varieties.

In Zimbabwe, cowpea seed from improved varieties were distributed to farmers and their organisations and to District Extension Officers in Matebeleland North and South and Midlands Province to establish demonstration plots for their districts.

The outputs from the project were used in the CGIAR indigenous vegetable programme of the Asian Vegetable Research and Development Centre (AVRDC), Arusha, Tanzania. These were incorporated into further research projects in Cameroon and Tanzania and in training programmes for African researchers.

#### 13. **Where** are the outputs currently being used? As with Question 11 please indicate place(s) and countries where the outputs are being used (**max. 250 words**).

The improved germplasm was used by the Crops Research Institute, Ghana for further breeding research programmes.

The outputs and information from these projects has been incorporated in the website of the Plant Resources of Tropical Africa (PROTA) at <http://www.prota.org>. The direct target groups for the PROTA information are the decision-makers in government, private sector, research, education and rural development, whose decisions affect millions of people depending for their livelihood on the plant resources.

The findings from these projects and more extensive information on African IVs have also been distributed as a book (Schippers, R. R., 2000. African indigenous vegetables. An overview of the cultivated species. Natural Resources Institute/ACP-EU Technical Centre for Agricultural and Rural Cooperation, Chatham, United Kingdom. 214 pp.) and on CD-ROM.

The results from these projects were also fed into the CGIAR with a DFID-funded project at the Asian Vegetable Research and Development Centre, Arusha, Tanzania (Project title: Improving Food Security in Sub-Saharan Africa Through Increased Utilization of Indigenous Vegetables: Studies on Seed Production and Agronomy of Major African Vegetables). The project transferred the approaches developed in the CPHP projects to Cameroon and Tanzania with the aim of developing new varieties from local landraces and to carry out basic agronomic studies on these new varieties. It is anticipated that wider dissemination will be achieved through this CGIAR linkage.

*14. What is the scale of current use? Indicating how quickly use was established and whether usage is still spreading (max 250 words).*

The scale of current use in the project countries is limited because of institutional issues of technology and output transfer, particularly in areas of seed delivery. For instance in Zimbabwe, for reasons unconnected with the normal problems of research uptake, further dissemination has not been possible in the last few years with the erosion of institutional infrastructure in Zimbabwe.

*15. In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as the key facts of success? (max 350 words).*

One of the key factors for success in adoption of research outputs begins with ensuring that the outputs meet the needs of the end-users/beneficiaries. It is important to identify these carefully, being mindful of gender issues e. g. certain crops are usually the domain of women. Other groups such as traders and processors have an important place in achieving success, since they may be keen to adopt improved produce, new commodities, but equally they will not be able to sell produce where there is no market.

Having identified key end-users, it is important to work with them in the research process and in dissemination e. g. farmers' school, trade groups/associations. Other agents for adoption e.g. extension agents, should also play some part in the research process by establishing partnerships with nodal organisations e.g. farmers' associations, traders, supermarket network, to develop training programmes with end-users.

An important element for wider transfer of technology is an effective trainer of trainers programme to achieve wider dissemination. This system should have at its apex a capable cadre of trainers who have the capability to



receive and adapt knowledge in collaboration with researchers and other specialists and to develop the appropriate materials that can be cascaded down to a wider network of intermediary trainers and then on to end-users.

In transferring knowledge it is important to take a holistic approach to ensure that, if necessary other constraints in all parts of the value chain have been addressed and if necessary establish appropriate training programme for all players, e.g. labourers, farmers, transporters, traders, and public and private sector trainers and technical staff. A significant outcome of this approach can be the strengthening of linkages between different groups, and to enhance their capacity to articulate their needs and to contribute to the innovation process.

## Environmental Impact

### H. *Environmental impact*

24. *What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)? (max 300 words)*

*This could include direct benefits from the application of the technology or policy action with local governments or multinational agencies to create environmentally sound policies or programmes. Any supporting and appropriate evidence can be provided in the form of an annex.*

An important benefit of working with indigenous crops is to gain an understanding and make greater use of crops that have adapted to local environmental and edaphic pressures. Greater benefits arising from the use of indigenous crops will help to maintain biodiversity and stabilise fragile eco-systems.

25. *Are there any adverse environmental impacts related to the output(s) and their outcome(s)? (max 100 words)*

Four potential environmental impacts can be identified from developing markets for natural products: bio-diversity loss, soil degradation, watershed degradation, and global warming and pollution.

In developing market opportunities for some IVs it is important to recognise the danger of biodiversity erosion where those crops are collected from wild sources to avoid overexploitation as has happened with some species. For example in Nigeria, many of the approximately 150 different local vegetable species are becoming scarce. The main reason for that is not that their demand is declining but the fact that it is becoming harder to collect them from the wild. Some of these crops used to be common in the natural forests but have been harvested to extinction and the only reason why they can still be found today is that some people started to domesticate them. Other species were not domesticated and can no longer be found today.

Also, greater commercialisation of traditionally wild-harvested or low input systems may increase the use of agro-chemicals, often in fragile eco-systems.

26. *Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of*

*natural disasters and increase their resilience? (max 200 words)*

The increasing unreliability of rainfall in many parts of southern Africa, has called into question official policies encouraging the cultivation of crops dependant on reliable rainfall, and has highlighted the need to explore other approaches to food security. Policy development and implementation is often constrained by lack of understanding and attention to gender and local knowledge considerations. The projects funded by the CPHP have begun to address the need to understand the importance of IVs, gender aspects of cultivation and trading, and how simple technologies can enhance their productivity. However, there remains the need to devote more resources to understand the role of these indigenous species in relation to climate change.

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