Strengthening capacities and informing policies for developing value chains of neglected and underutilized crops in Africa- Zimbabwe National Action Plan

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1. Introduction

Many crop species have been identified in Zimbabwe as national underutilized crop (NUS). These crops have been found to be valuable particularly for the high levels of nutrition such as protein, minerals while many of them have drought resistant properties. Food and nutrition insecurity are common challenges in countries in Southern Africa. Crop production in these countries is predominantly based on dry land agriculture. These are characterized by low unreliable rainfall that is often poorly distributed, leading to low yields. Many of the underutilized crops have been proven to have characteristics that make them drought tolerant. Furthermore, the staple food crops that are grown such as maize, is typically vulnerable to drought and is low in protein. Other staple food crops are sorghum and millets. These staple food crops are also very low in protein and it is essential to augment the diets with foods derived from crops that are high in proteins and minerals. Bambara nut and grain amaranth have been shown to be both drought tolerant and high in protein and minerals and essential amino acids to human nutrition. The national workshop conducted in 2014 under the auspices of the project revealed the level o awareness, opportunities and gaps in the utilization of these crops. The following is a proposed national action plan based on the findings of from the workshop.

2. Key findings from the workshop

2.1 Drought resistance

The key findings from the national workshop were that the two crops, Bambara nut and grain amaranth have advantages in that they have properties that make

them drought resistant. This makes the two crops highly valuable in strategies to cope with some of the effects of climate change where precipitation is expected to be low and the rainy season tending of much reduced duration. In particular ambient temperature has been shown to be increasing beyond the normal levels that are consistent with high yields of current crop species and the cultivars that are currently used by farmers. The combination of reduced rainfall and increased temperature requires the deployment of new technologies that respond to the high temperature and reduced precipitation.

2.2 Limited awareness

Despite the advantages outlined, public awareness of the advantages offered by these crops, thee is limited awareness of these advantages awareness of the advantages of these crops is very low. Consequently there is limited utilization of these crops. The low awareness is both at the farmer (producer) level and is particularly low at the consumer level.

2.3 Limited research

There is limited research on the two crops that was noted to be going on for these crops. This is because of he very limited funding that is made available for these crops. No major seed company was found to carry research program on the two crops. Publicly funded programs do not carry a research program on grain amaranth although a number of non governmental organizations carry research promotion programs on grain amaranth. Much more research was noted to be going on with Bambara groundnut but a number of constraints were noted to limited the commercialization of the crop to make it contribute more to food and nutrition security. Notably, very little funding is devoted to these crops which leads to the limitations in research that has been conducted on these crops. While production manuals for oilseeds, and major grain crops are readily available,

there are almost no manuals that farmers can access for the production of Bambara nut and grain amaranth.

2.4 Lack of improved cultivars

There are no officially released cultivars for grain amaranth and production is based on introduced material that has not been subjected to rigorous testing that leads to the release of an improved cultivar. Some improved varieties for Bambara groundnut were released by the national program however uptake of these varieties has been limited and there are constrained by limitations in availability of seed. This is however a result of limited commercialization and resultant low consumption of Bambara nut crop products which then leads to the low demand for seed for these crops.

2.5 Limited funding

For the major crops that are grown in the country, it was noted that support for research and production has been supported by funding at the national level. This has resulted in increased research output, wider adoption of the improved varieties. The support for production and a provision of markets for the crops also contributed to the availability and wider utilization of the popular crops in the country.

2.6 Availability of nutritious products

It was noted that there is a wide variety of nutritious products that have been derived from Bambara nut and grain amaranth. These however have not received sufficient promotion to stimulate demand for these products. These products were produced primarily by small organizations that have limited budgets to promote the products. In order to widen the utilization of underutilized crops

there is a need to stimulate demand through convincing consumers about the value of the products. Completion for space on the market is tilted towards the traditional crops that are already established and have received significant funding both from the private and the public sectors. Increased funding for promotion of these crops should lead increased uptake of the nutritious products from Bambara nut and grain amaranth.

2.7 Poor seed systems for NUS

Despite the presence of a highly developed seed system for major crops such as maize, wheat and soyabean, there is almost no seed system that supports Bambara nut and grain amaranth. This traces back to the policy support system that has led to the provision of limited financial support for Bambara nut and grain amaranth. The existing organizations that are engaged in the seed systems for established crops can carry Bambara nut and grain amaranth provided there is sufficient demand for the seed which in turn is driven by the demand for products from these crops.

3. The National Action Plan

The national action is focused towards addressing the key constraints that were identified in order to lead to strengthening of the Bambara nut and grain amaranth value chains. In order to develop the action plan the opportunites and strengths under each of the main limiting areas are outlined and the actions that have to be taken to address the limitations have been outlined. The product development cycle approach has been adopted, taking cognizance of the fact that consumption of the final product from these crops is what drives the value chain actors to participate in the promotion and support for the crop.

3.1 Research on Bambara and Grain Amaranth

3.1.1 Oportunities

1. Existence of a national Bambara nut improvement program.
2. Some improved Bambara groundnut cultivars are available.
3. Existence of a generally strong seed system for major crops.
4. Some research in universities and non governmental organizations for both Bambara nut and grain amaranth.
5. There is a national gene bank that is a repository for collected germplasm for crops.
6. There are some organizations and universities that conduct research work on Bambara nut and grain amaranth.
7. There are some private traders who specialize in trading with Bambara nut and grain amaranth seed and products.

3.1.2 Limitations

1. Limited funding for research has been availed at national level for conducting research on these crops.
2. Research has not availed production manuals for use by farmers in the production of Bambara nut and grain amaranth.
3. Limited germplasm for grain amaranth to work with for cultivar improvement.

3.1.3 Actions to address constraints

1. Collection of local germplasm for Bambara nut and grain amaranth.
2. Characterize the local germplasm and document for future use.
3. Develop and release improved adapted cultivars.

4. Conduct research to develop standard recommendations on agronomic practices for production of grain amaranth and Bambara nut.
5. Disseminate information on production to extension in government and in private organizations and development partners.
6. Develop and support a seed multiplication certificaion and distribution system.

3.2 Networks for Bambara and grain amaranth products

Established crops such as maize and wheat have existing networks in research, seed multiplication, distribution, production and marketing of the crops. These crops compete with the lesser known crops such as Bambara nut and grain amaranth. The result is that the demand for these products results in limited attention to the crops under NUS. It is proposed that separate networks be developed that will be funded and concentrate on promotion of the products of Bambara and grain amaranth especially the high levels of nutrition and the health benefits of these crops. Existing actors are small organizations and noon governmental organizations who have limited budges for promotion and support for these crops. The small organizations cannot afford the promotion costs that will lead to sufficient demand to support their business. This will lead to improved demand for the products from these crops and lead to improved production and eventually a strengthening of the value chain.

3.2.1 Opportunities

1. Organizations that work on value addition on Bambara nut and grain amaranth are available in Zimbabwe.
2. A range of products have been produced that are nutritious and easy to prepare.

3. There are experienced staff who can prepare consumable, highly palatable products from the two crops.
4. Prices of these products are reasonably priced and affordable.
5. There are many civil society organizations that are engaged in livelihood sport for local populations that be part of the networks.
6. Government supports village health workers that are available at Ward level who can promote the products.

3.2.2 Constraints

1. Limited knowledge on the value of the NUS on the market and among the health workers and agricultural extension workers who are potential promoters of the value added products.
2. Inadequate finances to disseminate the information on valuable food products from the NUS.
3. Limited policy support for these crops at policy level

3.2.3 Actions to achieve effective networks

1. Develop an inventory of all actors current and potential who work on Bambara nut and grain amaranth.
2. Assign responsibilities for promotion activities on promotion of products of Bambara nuts in strategic gatherings such as schools, public gatherings to increase awareness of the nutritious products of Bambara nut and grain amaranth.
3. Raise funds to support the activities in order to reach out to the communities.
4. Lobby government, local authorities, health promotion agencies to provide funds to support exposure of the value added products of Bambara nut and grain amaranth.

5. Engage the food and nutrition institutions in the private sector and the policy making body on food and nutrition and national provincial and at local level.

3.3 Inadequate knowledge on production practices

3.3.1 Opportunities

1. There are some organizations with knowledge on production of the two crops.

2. Some publications on production of grain amaranth and Bambara nut is available from some organizations.

3. Effective people who are in contact with the population at grassroots level are available at province district, and ward level are available and accessible for development work to support NUS.

4. Staff from the national extension system are available at ward level.

3.3.2 Constraints

1. Inadequate funds to support promotion activities within the organizations that work with NUS.

2. Lack of cohesive networks to support the dissemination of research and new products from grain amaranth and Bambara nut.

3. Stigma associated with NUS such as Bambara nut where the crop is regarded as a poor man's crop and yet it is a traditional crop that is nutritious and supplied protein to supplement the staple diets that are deficient in protein.

4. Knowledge of the crop grain amaranth is much less since the utilization of the crop as a grain crop is only recent.

3.3.3 Actions to address constraints

1. Demonstrations of Bambara and grain amaranth crops on smallhoder farms to expose farmers to these species and the value in food and nutrition and drought mitigation.

2. Exposure of people at ward level on the various nutritious products prepared from Bambara and grain amaranth in order to stimulate demand.

3. Demonstrate how to prepare various recipes for Bambara and grain amaranth value added products and train a specified number at ward level who will act as trainer of trainers and for training residents at ward level.

4. Develop and stock some centres for the supply of NUS crop products.

5. Promote some highly; nutritious convenience foods that can be bought easily and at an affordable price.

6. Demonstrate the drought resistance that the crops have as an advantage over traditional crops such as maize.

Conclusion

A background to the value of Bambara nut and grain amaranth to food and nutrition security has been presented. The major constraints to the utilization of these species have been outline. Strategies to overcome the constraints and increase utilization of these cops have been outlined. These require funding in order to support the value chains. Most of the current value chain actors are small and are not in a position to mount promotion programs that can make a major impact on the improved utilization of Bambara nut and grain amaranth.