

Buchu Commercialization: South Africa

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Summary

For centuries, the people of South Africa have eaten the leaves of *Agathosma betulina* (known as buchu) to relieve stomach complaints. Powdered dried leaves are also mixed with sheep fat to produce an ointment that gives the skin a healthy sheen and is antibiotic. When Dutch settlers arrived in the 17th century, later followed by British settlers in the late 19th century, they too used this useful plant to treat a range of ailments.

Today, buchu is one of three South African medicinal plants that is used in international medicine. In addition to its therapeutic qualities, the plant's oil has a distinct blackcurrant smell and flavour, which makes it an excellent ingredient in food flavourings and aromatic oils.

In recent years, growing popularity at home and abroad has led to increased exploitation of wild buchu supplies, jeopardizing the plant's future survival. In August 1999, the Agricultural Research Council (ARC) of South Africa initiated a project to protect the country's indigenous genetic material, prevent buchu from becoming extinct, create jobs and serve the national economy. The main aims and outcomes of this effort are to:

- Cultivate buchu commercially to reduce harvesting from the wild and make the plant more attractive to overseas users who do not approve of putting natural resources at risk.
- Build gene banks to safeguard traditional varieties and develop new ones through farmers' experiments.
- Adapt varieties from the gene banks to suit local conditions and meet the demands of international markets. Such efforts discourage harvesting from the wild because adapted varieties have higher concentrations of useful ingredients and are therefore more valuable. At the same time, research institutions can earn money from royalties on the new cultivars they produce.
- Establish an organic certification scheme for South Africa to help increase awareness of organic cultivation methods, especially for indigenous medicinal and other natural products.
- Share research results with farmers through, for instance, guidelines on the cultivation of buchu and new improved seed germination techniques.
- Develop ways of cultivating buchu in a hydroponics system — that is, in sand, liquid or gravel, without soil.
- Improve marketing practices to increase producer profits, for example, by exporting buchu oil rather than the plant's less lucrative dried leaves.
- Encourage commercial buchu production in disadvantaged communities to give the communities more power and, ultimately, to help South Africa's economic development.
- The main activities of the ARC project are:
 - Conducting crop science research on how to propagate and cultivate buchu.
 - Conserving genetic material in a gene bank.
 - Fostering community development by using buchu cultivation as a source of income and jobs.
 - Patenting high-quality clones and breeding cultivars to protect the South African buchu industry from foreign competitors.
 - Establishing a nursery to supply good-quality buchu to industry and, particularly, resource-poor farmers.
 - Conveying the benefits of growing buchu to the agricultural community.
 - Forging partnerships to share information and technology as a way of advancing the project and using existing knowledge and expertise.
 - Building marketing channels to boost consumer demand and prices.

Background and Justification

Until 1995, the only sources of buchu were wild plantations in the mountains of the Western Cape. This put the resource at risk. As the local population, unemployment, European demand for buchu, and the plant's value and marketability all grew, harvesters were encouraged to collect more and more of it. Poor cutting procedures, overharvesting and harvesting at the wrong times of year were preventing buchu plants from producing seeds for the next generation. At the same time, frequent fires, pests and diseases and the spread of agriculture were encroaching on buchu's natural habitat, leaving it with less space to grow in and more problems to contend with.

Fortunately, a group of local farmers in the buchu zone realized how valuable this natural resource could be. Patches of buchu grew wild on uncultivated corners of the farmers' lands, and they became concerned when these patches began to shrink and deteriorate. Action had to be taken before it was too late. The farmers shouldered the initiative themselves by investigating possible ways of cultivating buchu on their farms.

At the same time, a worldwide shortage of buchu oil fueled fears that other countries might start cultivating their own plants or developing synthetic substitutes. This would have robbed South Africa — where buchu and knowledge of its medicinal uses were first developed and used — of the chance to exploit one of its commercially valuable indigenous resources. Such fears were not unfounded. Critics could point to many previous examples of large foreign companies assuming control of South African industries and denying the country its rightful share in the economic benefits.

The ARC project, addressed a wide range of issues, including research into the plant and its uses, education of farmers and users (or potential users), development of South African industry and exports, protection of the natural environment, socio-economic development of South African communities and the country as a whole, and the expansion of local traditional knowledge into the wider area of modern international medicine.

Description

ARC project researchers began by studying the buchu plant, evaluating its uses and assessing the problems. It soon became clear that a sustainable supply of high-quality buchu had to be made available, and that the best way of achieving this goal was to set up commercial plantations. These plantations would provide valuable material for South African export markets; help the economic development of the Western Cape; supply jobs to resource-poor rural communities; and protect wild buchu from extinction. Another pressing need was the creation of gene banks where the plant's genetic material could be conserved and developed.

With these goals in mind, researchers worked diligently to select plant material that met the standards of international food and pharmaceutical industries. A previous move to cultivate buchu in the 1950s had failed because farmers chose to plant a species (*Agathosma crenulata*), that was easy to cultivate rather than the more demanding *Agathosma betulina*, which produces far more oil and has a better flavour. In fact, these earlier experiments with buchu cultivation worsened the situation for valuable wild *A. betulina* supplies because *A. crenulata* was introduced to *A. betulina* areas, leading to hybridization between the two species that made it increasingly difficult to propagate pure *A. betulina*.

The project therefore had to monitor and protect the surviving wild *A. betulina* genetic material. That is where the gene banks first came into play. Working with private companies, ARC set up mother blocks of buchu plants from which to take cuttings to apply research to propagation without damaging the wild resources. The cuttings also produced good-quality seeds that ARC and the private companies germinated and planted to build up a sustainable supply of seedlings and rooted cuttings. These seeds were then sold to farmers who planted and cultivated them on a commercial scale in new plantations on their land. ARC also gave seedlings away to farmers who were willing to allow researchers to collect seeds from the wild plants that grew on their land.

A special programme was initiated to increase the area planted in buchu. Interested people in disadvantaged communities were encouraged and assisted in buchu-growing ventures with supplies of seedlings and financial support. Thanks to its long history of traditional uses, the plant enjoyed a good reputation in these communities and virgin land was used for the new plantations to avoid affecting

existing agriculture. In Cupertino with the US Agency for International Development (USAID) and the US Herb Research Foundation, ARC set up advisory and training services for farmers to teach them how to cultivate buchu in a sustainable way. ARC also created efficient marketing channels to make sure that disadvantaged communities received the best prices possible for their crops. And, because it is the plant's oil that makes it valuable, steps were taken to refine the oil locally using South African labour and enterprises.

ARC had to build trust with existing producers to encourage them to describe the various cultivation methods and practices that they had found to be most effective. In this way, project scientists could save time and money by going straight to testing and evaluating the best-known practices, rather than having to start their research from scratch. ARC guidelines were based on these tests and evaluations.

Thus far, the best microclimate, altitude and fertilizers for buchu have been chosen. In addition, soil and water requirements have been roughly determined but still need additional refinement. Germination techniques developed at the gene banks have a 70 percent success rate for producing seedlings from seeds. A private company has identified clones that allow buchu to multiply from the cuttings. A way of cultivating buchu through hydroponic techniques also has been discovered.

To protect the remaining wild supplies of buchu, ARC has developed rules for sustainable harvesting and disseminated these rules among all harvesters and farmers who have approached the council for advice or seedlings. Private companies have also encouraged all buchu suppliers to follow these rules and made training available to those who need it. At the same time, ARC and other groups have pressed for legislation to protect buchu by drawing government and public attention to this need and suggesting general principles to accomplish it. Conservation has been helped by buchu's increased value as a crop — people with an economic interest in a plant are more likely to co-operate with attempts to minimize cross-breeding and protect the genetic quality of that plant.

About 50 percent of the buchu sold and distilled in South Africa still comes from the wild, which makes it an unacceptable import to many industrialized country markets, including the United States. However, one of the plant's main attractions, especially in Europe, is that it is an organic product.

South African cultivators therefore have to follow strict guidelines and prove to their international clients that their crops have been cultivated organically. There is no organic certification scheme in South Africa. As a result, growers must pay high certification fees to foreign companies at a cost that is beyond the reach of many poorer, potential buchu cultivators. ARC is working on a certification scheme for organic produce in South Africa as a way around this problem.

Thinking ahead, ARC is also tackling the potential problem of oversupply. At present, the buchu market, estimated at US\$2.5 million, is undersupplied and production needs to double to satisfy the demand. However, if production increases too quickly, there is a risk that the market will be oversupplied, prices will slump and the benefits of the newly established commercial cultivation will be lost. The answer, according to ARC, is to insist on high standards and quality from buchu cultivators.

Patenting and Commercialization

A private medical company that sought to find ways of multiplying buchu through the use of cuttings, has registered patents for the cultivars that it developed. ARC is still searching for user-friendly cultivars that are easy to propagate through cuttings and will patent these cultivars when it finds them. This kind of biological research is very complicated, however. As a result, it is likely to be several years before ARC registers any patents.

Buchu cultivation has now been commercialized at two levels: institutions and private companies are producing seedlings to sell to farmers who are interested in commercial buchu growing. These efforts are prompting farmers to turn more land over to the crop. For example, one farmer who produces 150 tonnes of buchu per annum has recently planted another 9 hectares from which he expects to harvest an additional 90 tonnes per annum within two years.

Partnerships

ARC has found it difficult to forge formal partnerships with the private sector in South Africa because companies and individuals that produce and market buchu are unwilling to share their experience and

expertise with potential competitors. At the same time, ARC has been reluctant to enter into partnerships with foreign companies that have approached it because it does not want South Africa to lose the benefits of buchu cultivation, processing and marketing to commercial enterprises outside the country.

Consequently, partnerships only exist with such international funding agencies as USAID, which includes buchu among the medicinal crops that can help the development of disadvantaged rural communities under its Agribusiness in Sustainable Natural African Plant Products project.

Replicability

ARC's buchu project could easily serve as a model for other medicinal plant projects in South Africa. In fact, part of ARC's main business is to provide farmers with good products and information on crop-related agriculture and markets. The project could also be of interest to other developing countries where there are traditional medical systems because it shows how good-quality medicinal products can be made available at affordable prices and how local plants can be used to boost community and national agriculture, industry and the economy.

Lessons Learned

The following lessons can be drawn from ARC's experience:

- Cultivation of wild crops according to carefully designed guidelines promotes conservation of endangered plant species.
- Public and private sectors should work together both nationally and internationally. In the ARC buchu project, the public sector (ARC) encouraged private companies to co-operate. However, competition stimulates innovation: If there are too many partnerships, there is a risk that monopolies will start to develop causing competition to disappear.
- A main aim of the project has been to prevent the shortage of buchu from fueling price increases that encourage buyers to look for substitutes. Oversupply, on the other hand, would lead to price reductions and discourage farmers from cultivating the crop. ARC's solution was to find ways of adding value to the product and ensure that only high-quality plants were sold on the national and international markets.
- The people who first knew and used a traditional medicinal crop should benefit from the development of that crop as it starts to play a role in national and international markets. In the past, people in developing countries often have not reaped the economic benefits of their country's resources and cultural practices because of colonization, forced relocation, industrial and recreational development and the introduction of alien agricultural practices. When the original source of a medical practice or product is acknowledged and publicized, people in other countries also benefit, not only from the new cure or therapy itself but from learning more about another culture.
- Policies and legislation to protect buchu must be created. Users of the plant and its product, as well as policymakers, should be educated about the importance of respecting conservation practices.
- Commercial cultivation involves making a sustainable supply of good-quality buchu available. This is good news for conservationists and the South African economy but bad news for people who have earned a living from harvesting wild buchu. Wild harvesters must be given the opportunity to start cultivating buchu as a sustainable source of secure income.
- Despite the United Nations Environment Programme's Convention on Biological Diversity, which states that the sovereign right of a country over its genetic resources must be recognized, developing countries still risk losing the benefits derived from their own indigenous plants and expertise. Although plant breeders' rights and patents can be legally registered, it has been impossible to do so for ARC's buchu cultivars because they do not differ enough from wild species. To protect South African interests in buchu, ARC decided not to enter into any agreements with other countries. This meant that it had to be careful not to divulge research findings that could be used elsewhere. As a result, ARC only passes information to those who are

going to cultivate buchu in its natural environment — that is, the mountains of South Africa's Western Cape.

- At the start of the project, ARC worked hard to dispel the distrust of existing buchu producers who feared competition from new growers. The benefits derived from the project did a lot to overcome the producers' reservations because all producers, including those not involved in the project, stood to gain from increased markets and higher prices. New foreign markets for organically grown buchu were opened up and ARC ensured that overproduction did not occur.
- Quality must be maintained by planting only species with desirable levels of active ingredients. If quality is compromised, industry and the market may start to investigate the potential for using synthetic substitutes.

Impact

Both the production of buchu and the area under cultivation increased dramatically over the project's first 18 months. More of the plant is being delivered to South African buchu oil refiners and there is a constant stream of inquiries and requests for seedlings from people interested in cultivating buchu.

The local medicinal plant industry has begun to pay more attention to the sustainable use of indigenous natural plant products. Large landowners and the Department of Nature and Environmental Conservation are being encouraged to adopt crop rotation and land division. The market is being carefully monitored to ensure that illegal harvesting or bad harvesting practices are not carried out, and growers who stick to the guidelines are being issued licences. Gene banks make it possible for researchers to carry out experiments on plants and plant material without having to depend on shrinking wild supplies.

Many new communities have begun to cultivate buchu and ARC has upped its supply of seedlings and rooted cuttings to satisfy the increased demand. Markets are being developed to make the most of buchu's present and future potential as a source of income and entrepreneurship is being encouraged among growers, processors and sellers. Last, but not least, by making buchu — a relatively inexpensive pharmaceutical product — more available worldwide, ARC and South Africa is contributing to global health.

Future Plans

Groups of growers involved in specific medicinal and natural products are being put together with money from international funding agencies. These groups will function as marketing and support organizations for farming communities. By the time that the international financial aid has expired, ARC expects to continue its research with the money it raises from supplying farmers with information and plant material.

The local organic certification authority that ARC is pushing for will help farmers by certifying their produce as organic without involving expensive foreign schemes and authorities, thereby adding value to the farmers' buchu crops and increasing the value of South African buchu oil for use in medicines and food flavourings. ARC will share its expertise by informing farmers about organic cultivation methods and evaluating crops to ensure that they are organic. ARC intends to extend the organic certification system by forging a certification alliance with other countries in southeast Africa.

Implementing Institution

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