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Strengthening Traditional Technical Knowledge: the Sugar Cane Wine Example

African countries are endowed with considerable potential for processing a large variety of plants (fruits, leaves, roots, tubers, stems, flowers), to make food and drinks (fruit juices, wines, etc.). In the context of globalization, local products already in high demand in their region of origin could also be successfully marketed nationally and internationally. Although a few of these traditional products are found in some local markets, most of them remain little known. Sugar cane wine is one of them.

In Angola, Congo, and the Democratic Republic of Congo (DRC), sugar cane has three main uses. First, it is consumed as a "*canne de bouche*" (literally, cane for the mouth), to quench one's thirst, and/or to assuage one's hunger. Consumers peel the cane with a knife, chew on the tender part, suck on it, swallow the juice and get rid of the bagasse (the fibrous portion of the sugar cane remaining after the juice has been extracted). Second, it is used as a raw material to produce sugar. Third, it is used in the preparation of sugar cane wine, called "*lungwila*."

This article examines the knowledge process used to make sugar cane wine, a traditional product in the three countries mentioned. There are several reasons for this choice: (i) the wine-making traditional process is an ancestral practice, transmitted from one generation to the next; (ii) sugar cane wine consumption is growing substantially in rural as well as urban areas. Indeed,

the product is known and well-appreciated in the capital cities of the three countries mentioned, with approximately 9 millions inhabitants (2 million in Luanda, 600,000 in Brazzaville, and 6 million in Kinshasa), as well as in other less populated cities and towns; and (iii) the market for sugar cane wine is therefore potentially important, and sugar cane (traditional) processing contributes to job creation and constitutes a source of income for small food processing enterprises, established mainly in the rural areas and suburban zones. The knowledge used is specific to the local populations of Northern Angola, Southern Congo and the Western Democratic Republic of Congo, allowing entrepreneurs from these regions to enjoy a comparative advantage. In addition, the growing demand for sugar cane wine has a stimulus effect on sugar cane production, and is increasing the need for the equipment and packaging.

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Building on traditional knowledge

Sugar cane technology

The expansion of the sugar cane wine market has helped to improve production plant and work organization. In Kimbongo, an area of intense activity, wine processors have formed associations in order to reduce the difficulty of the work. They use bagasse as a fermentation substrate. To replace the one-lever press, they invented a manual two-lever press, and then a mechanical press. In 1997, Mexican technology was imported and introduced in the various regions where the wine is produced. It was adopted because it shortens the transformation process, reduces the difficulties in the work process, and improves the rate of juice extraction. However, its use remains limited because of its high cost, and local artisans are developing a local version.

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Knowledge transmission

The sugar cane winemaking process comes from the ancient kingdom of Congo. Descendants of various communities who use to live there are now found in some regions of Angola, Congo, and the Democratic Republic of Congo.

This knowledge is held by men only – usually elders - and raw material is usually self-supplied. Women are active in the final stage, i.e. in the marketing of the finished product. Historically, the knowledge is transmitted within clans and families, from one generation to the next. With urbanization and the introduction of sugar cane wine in some markets, other forms of transmission have emerged, particularly within producer groups and associations as well as in peri-urban environments.

Small business owners transmit it to their employees, who, most of the time, are their relatives. Within wine-making associations, the learning system that prevails is relatively different, with two coexisting modes of apprenticeship: elder to younger transmission, and knowledge sharing.

The first method of apprenticeship (elder to younger) is the one found in family-owned businesses, where the main beneficiaries are the younger, or those untrained persons who wish to start their own business.

The second method is based on knowledge sharing. It is a system where members of associations exchange their know-how. A member who masters a specific operation (fermentation for example) will share it with his peers, and will receive in exchange some other knowledge. These exchanges contribute to improving the skills of the producers group as a whole.

Unlike other formal learning systems, beneficiaries from traditional training do not have to pay to acquire it. This is a solidarity system inherited from ancient traditions. For entrepreneurs, this system has numerous advantages:

It reduces starting costs. Indeed, the entrepreneur who wishes to produce sugar cane wine can easily acquire the related knowledge. In Kimbongo for example, hundreds of processors start their businesses without having to go through the usual administrative steps, and without information and training costs.

In addition, every entrepreneur who becomes part of a producers association in urban as well as rural areas, can improve his knowledge through the custom of experience-sharing between members. This can be considered as a form of continuing vocational training developed by local communities as well as collective innovation management without the support of the usual formal appropriate institutions.

Prospects

Indigenous technical knowledge is often under-estimated by development researchers, decision-makers, and practitioners. This situation has had a negative impact on the design and implementation of policies.

The example of sugar wine making in the DRC highlights some important lessons regarding indigenous technical knowledge and its importance for African economic development. Some issues need to be highlighted. The production process is characterized by low productivity, disrupted activity, shortages in raw materials and supplies (due to the seasonal harvesting of sugar cane), storage problems for large quantities of wine, etc. This situation creates regular wine shortages on the supply side.

In addition, traditional technical knowledge does not permit the exploitation of by-products (bagasse, peelings). Moreover, not to recycle these waste products aggravates pollution in the workshop surroundings. Finally, the traditional production process lacks the packaging and bottling techniques adapted needed for remote markets.

Regarding these constraints, it is crucial that development agents (entrepreneurs, researchers, NGOs, public authorities, etc.) try to both understand traditional technical knowledge and strengthen it. In this instance, the focus needs to be on developing appropriate packaging, recycling waste, and improving production plant facilities, etc.

Strengthening indigenous technical knowledge

Development practitioners seem to be paying more attention to the objectives and functions of scientific indigenous knowledge. This does not mean that external assistance is not useful or needed - it means that these practitioners

should built on their indigenous knowledge and skills. The combination of traditional and exogenous techniques (non-traditional but also traditional, emanating from other communities), may contribute to improving the production process. This approach is quite different from the one that proclaims that development agents know "everything" and constitute the best transfer mechanism for science and technology from research and development institutes to local communities. The producers and users of local knowledge are often the real "experts". Scientists and technologists, when involved in development, should listen to them and make the most of their knowledge and experience, and find ways to complement each other's knowledge.

In spite of the technical difficulties that they encounter and their relative exclusion from the national production system, users of traditional knowledge are technically capable of responding to changes in production conditions and finding innovative solutions to their problems. It has often been noticed that the more critical their situation, the more inventive they become. Indeed, local communities often resort to a wide range of traditional knowledge to adapt their production techniques in order to ensure a good quality for their final product.

Research and development organizations have a critical role to play in the acknowledgment of indigenous technical knowledge, and the promotion of development programs aiming at their valorization. Indigenous technical knowledge may be revitalized by decentralized forms of government emphasizing a policy of local development. In addition, the current trend in favor of so-called "ethnic products" opens a new way to the development (through export) of products born from traditional activities.

Promoting indigenous technical knowledge

The current globalization of exchanges requires a reorganization of African economies. This requirement is becoming more and more necessary and raises problems that the centralized approaches (of the Keynesian type) are unable to help solve. Decentralization at the regional and local levels allows the application of economic solutions to problems that are better apprehended by a decentralized entity, closer

to those who are supposed to devise these solutions, apply them and benefit from them. The creation of businesses relying on indigenous technical knowledge also means jobs creation at a local level. This approach would trigger a new dynamism of economic activity based on local human, physical, and financial resources. Such local initiatives may result in the emergence of a local industrial structure comprising of small businesses. This would of course need an enabling environment and appropriate assistance.

Development agents can promote these activities through focusing on innovation processes in collaboration with producers organizations. These organizations can also form partnerships within the framework of decentralized cooperation structures. Government awareness of the social and economic impact of these activities is essential, in order to design and implement an incentive-based policy to promote the commercial development of local products.

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