



## Safeguarding local crop knowledge: the use of community biodiversity registers

*Top photo: The registry of seeds, Sterkspruit community seedbank, South Africa. Credit: Bioversity International/R.Vernooy*

*Montserrat Gómez César<sup>1</sup>, Ronnie Vernooy<sup>2</sup>, Bhuwon Sthapit<sup>3</sup>*

*<sup>1</sup> Bioversity International, Pokhara, Nepal /Wageningen University and Research, the Netherlands*

*<sup>2</sup> Bioversity International, Rome, Italy*

*<sup>3</sup> Bioversity International, Pokhara, Nepal*

### Background

The heterogeneity of the earth's landscapes and cultures has stimulated a diversity of knowledge and skills in rural communities related to the biological resources in their surroundings. For centuries, customs and oral transmission have enabled the transfer of a locality's collective knowledge about plants from parents to children. However, in recent times, global dynamics, such as the commercialization of agriculture and outmigration of the younger generation, have hindered this transfer (Subedi, Udas, et al. 2005). In addition, the economic liberalization of trade and a shift toward export-oriented agricultural production have effectively reduced the viability of local markets and, ultimately, the attractiveness of small-scale agriculture as a livelihood strategy (IPES-Food 2016).

The growing disinterest of younger generations in traditional agriculture reduces the number of knowledge 'recipients' (Quek and Friis-Hansen 2011), i.e., those members of the community who are willing to learn, practise, and expand traditional knowledge. Many rural

communities, such as the pilot sites for the work on community seed banks in South Africa (see below), face this problem.

Moreover, the promulgation of intellectual property rights (IPRs) has established an international legal framework that entitles those who hold patents to genetic resources



*Photo: Ageing agriculture: farmers of Sterkspruit, South Africa. Credit: Bioversity International/R.Vernooy*

to appropriate benefits with no obligation to recognize or reward the original custodians of the plants, seeds, and related knowledge. This is an effective form of monopolizing local genetic resources (Subedi, Udas, et al. 2005). Such IPR system encourages bioprospecting, the ‘discovery’ and commercialization of biological resources. In some cases, this has led to the misappropriation of traditional forms of knowledge, a practice known as biopiracy.

The erosion of biodiversity and its associated traditional knowledge and the rise of biopiracy were important factors leading to the Convention on Biological Diversity (CBD), which was adopted in 1992. Under international law, the CBD holds signatories accountable for the sustainable use of biodiversity and for regulation of access to its associated traditional knowledge and requires equitable sharing of benefits that arise from the use of genetic resources.

## Putting CBD principles into practice

In keeping with the CBD and in recognition of the key role biodiversity conservation plays in sustainable development efforts, the Nepal Agricultural Research Council (NARC) and Local Initiatives for Biodiversity, Research and Development (LI-BIRD), together with what is now known as Bioversity International, piloted a

**Table 1.** Examples of data to be collected for inclusion in a biodiversity register

<p><b>General information</b></p>	<p>Geographic coordinates of community</p> <p>Site descriptors: altitude, climate, soil</p> <p>Number of households</p>
<p><b>Information organized by crop variety</b></p>	<p>Custodians</p> <ul style="list-style-type: none"> <li>• Passport data</li> <li>• Address of farmers who keep rare varieties (and even their photograph)</li> </ul> <p>History</p> <ul style="list-style-type: none"> <li>• Year of introduction and address</li> <li>• Origin of variety/breed</li> <li>• Original source of reproduction material</li> </ul> <p>Agronomic facts</p> <ul style="list-style-type: none"> <li>• Information on species, variety, and breed, including both scientific and local names</li> <li>• Distinguishing characteristics, as defined by farmers</li> <li>• Means of propagation</li> <li>• Nature of species, i.e., annual, perennial, deciduous, etc.</li> <li>• Natural habitat, as defined by farmers</li> <li>• Growth stages and seasons, as defined by farmers</li> <li>• Distribution of species within community, i.e., rare, medium, widely grown</li> </ul> <p>Uses</p> <ul style="list-style-type: none"> <li>• Direct, medicinal uses, goods, and services provided by the species</li> <li>• Different uses for the various parts of the species</li> <li>• Local processing and cooking techniques</li> </ul> <p>Traditional knowledge</p> <ul style="list-style-type: none"> <li>• Traditional knowledge and practices that describe the reproduction, cultivation, harvesting, processing, consumption, and uses of a species</li> <li>• The cultural management of the species, i.e., gendered division of labour</li> </ul>

Source: Adapted from Subedi et al. 2012.

Figure 1. Example of a biodiversity register from Nepal (in Nepali). Source: Paudel et al. 2015

बाली	धान	
वैज्ञानिक नाम	<i>Oryza sativa</i>	
जात	काठे गुठी	
खेतीका लागि उपयुक्त क्षेत्र	१०० देखि १४०० मिटरसम्मको उचाइ भएको, टारी तथा पानी कम लाग्ने क्षेत्र ।	
जात पाइने स्थान	बेगनास र नजिकका गाउँहरू, कास्की ।	
उत्पादकत्व	प्रतिरोपनी १०० देखि १५० के.जी.सम्म ।	
बाली अवधि	जेठदेखि कात्तिकको दस्रो हप्तासम्म ।	
हुलिएमा	बोटको उचाइ १३० देखि १५४ से.मी. सम्म, बालाको लम्बाइ १९ देखि २६ से.मी. सम्म, दानाको आकार डल्लो मसिनो, दानाको टुप्पामा कालो रङ, पराल मसिनो र नढल्ने ।	
विशेष गुणहरू	भात खान मीठो, मल कम भएको टाउँमा राम्रो फल्ने, पानी रोप्ने बेलामा मात्र भए पनि आकासे पानीको भरमा उत्पादन दिने, रोगकीरा कम लाग्ने र नढल्ने ।	
प्रयोग	घामल भात खान र पराल बस्तुलाई खुवाउन प्रयोग गरिने ।	
हालको अवस्था	बेरे कृषकले थोरै जग्गामा खेती गरेको ।	

Source: Paudel et al. 2015

participatory method to enable the conservation of agricultural genetic resources on farm (Rijal et al. 2003; Subedi, Udas et al. 2005). This joint effort resulted in the design and use of a community biodiversity register as a practical tool for communities to: (i) establish an inventory to allow monitoring of crop diversity and to document its associated farmer (traditional) knowledge, (ii) generate a collective sense of community empowerment and ownership of genetic resources as a way to decentralize their management and conservation, and (iii) provide a record of the knowledge and uses of local biodiversity that can prevent biopiracy and enable the equitable sharing of benefits arising from the use of genetic resources (Subedi et al. 2012).

In the hands of a community seed bank, a community biodiversity register functions as farmer-managed database of its genetic resources. The formal register or record book includes relevant local

knowledge about the uses, cultural values, and agronomic traits of crops and crop varieties found in the community (Figure 1). It can also include information about the community members who register the seeds, such as name, sex, age, and years of residence in the community. Such register can be combined with a seed flow register or logbook. Moreover, by creating a register, i.e., a public record, a community or the members of a community seed bank carry out an act of legal protection of the documented resources.

### Content of a community biodiversity register

The specific content of a community biodiversity register varies depending on the values and conservation objectives of each community or community seed bank. Subedi et al. (2012) have recommended a minimum set of data to provide basic information on the current state and availability of local biodiversity

resources, as well as information on who holds knowledge about their various uses and why they are needed (Table 1).

Including photographs or drawings, even a herbarium specimen, to compliment farmers' descriptors can facilitate the transmission of knowledge to future generations (Figure 1). In communities where illiteracy might still prevail, the use of visuals has proven very effective. Use of vernacular language is always recommended, in some cases complemented by an official language to allow access to the records to those who have not mastered the local language.

It's surprising that, although community biodiversity registers have been around for more than two decades, little has been published about their design, use, and utility. (Exceptions include the work by Subedi, Sthapit et al. 2005 and Fabricius and Pereira 2015.) Two examples from practice follow.

## Use of biodiversity registers in Nepal

Experience from Nepal reveals benefits associated with the use of a community biodiversity register as well as recommendations. For example, when time and resources are limited, documenting and validating crop information can be carried out more efficiently during diversity fairs, where community members come together to share seeds and related knowledge, than by collecting data from individual

households or farmers (Subedi, Udas et al. 2005; Subedi et al. 2012).

The register can be an effective tool for identifying custodian farmers, those who donate a large number of samples to the community seed bank. Establishing a register can spark interest in conserving rare varieties, as farmers become aware of useful traits of varieties cultivated in small quantities. Especially when maintained over time, a register can foster a sense of ownership, pride,

and empowerment, as it allows for the recognition of the community's knowledge and guardianship over its biological resources — both by members of the community and outsiders (Subedi et al. 2013).

A major challenge in Nepal is the absence of a formal institutional framework that recognizes community biodiversity registers and offers concrete technical and financial support for their use and maintenance. In 2007, the

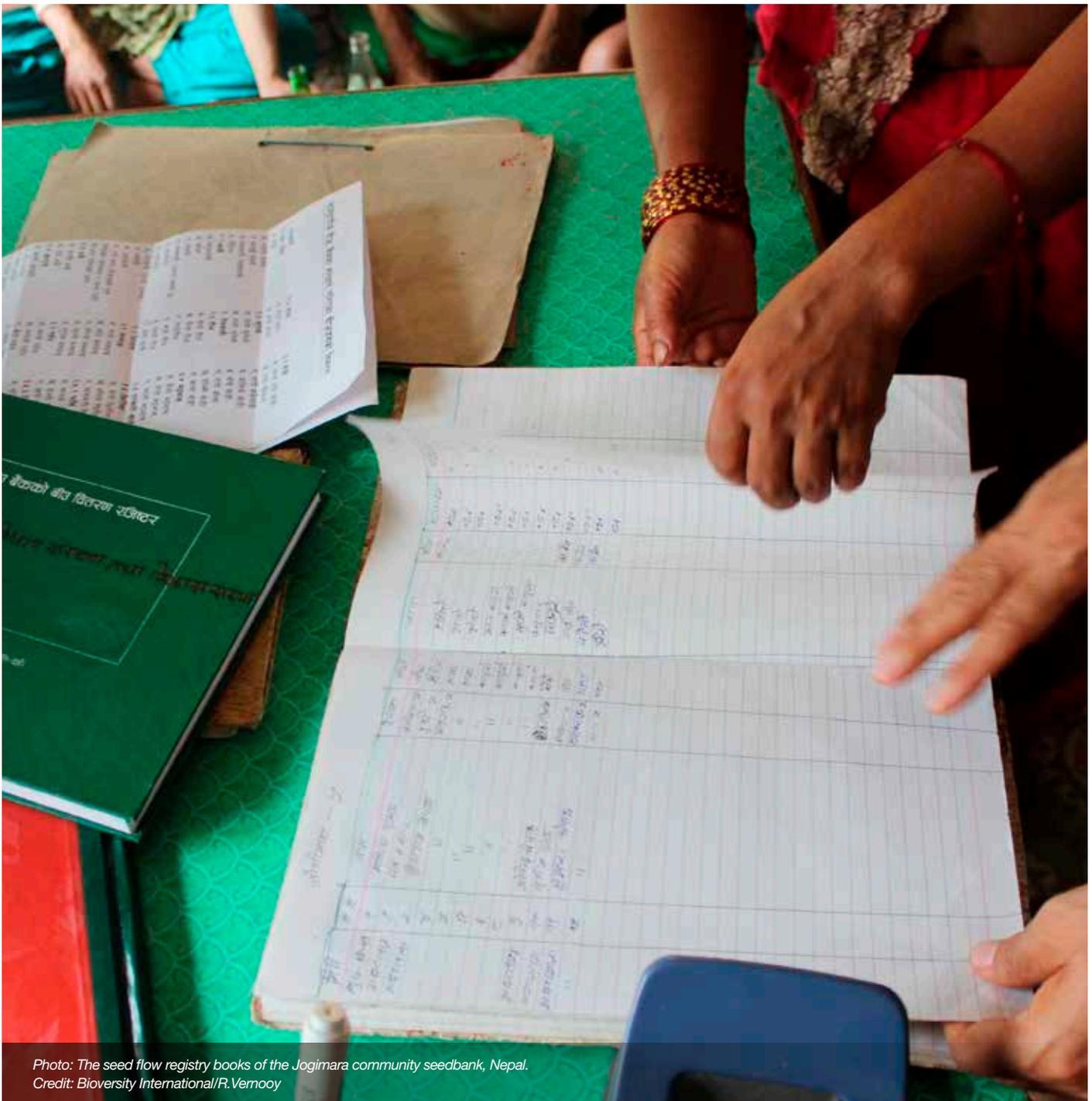


Photo: The seed flow registry books of the Jogimara community seedbank, Nepal.  
Credit: Bioversity International/R.Vernooij



*Photo: Members of the Gumbu community seed bank review the translation from English to Venda of the registry form.  
Credit: Bioversity International/R.Vernooy*

government of Nepal established an agrobiodiversity policy (updated in 2014), in which clauses 5.1.1.10 and 5.1.1.11 promote a community-based biodiversity management system and call for custodian farmers to be identified, documented, and encouraged to conserve agricultural biodiversity (MAOD 2015). However, concrete measures to operationalize community biodiversity registers as part of national biodiversity conservation efforts have yet to be developed.

### **Use of biodiversity registers in South Africa**

As part of collaborative efforts by Bioversity International and South Africa's Department of Agriculture, Forestry and Fisheries to establish and support community seed banks in the country, registers were set up for two pilot community seed banks (Tjikana et al. 2016). Inspired by the work in Nepal and elsewhere and considering local conditions, such as limited literacy and the use of a distinct traditional language at each site (Venda in Gumbu village, Limpopo, and Xhosa in Sterkspruit,

Eastern Cape), the following descriptors were included: crop name in the vernacular; English name; variety name (if any); local meaning of the variety name (if any); name of the farmer who donated the seed; number of years the variety has been cultivated by the farmer; origin of the seed (from whom or where the seed was obtained); type of soil in which the crop is grown; village(s) in which the crop is mainly found; crop productivity (yield/area); planting and harvesting times; distinguishing characteristics of the crop; reason(s) for cultivating the

variety; and cultivation trend over the last five years (in number of farmers or area) (Table 2).

Farmers at both sites easily grasped the utility of the register: to document and maintain useful local crop knowledge, share this knowledge with others interested in the community seed bank activities including the younger generation, avoid 'mix ups' of seed donations and exchanges based

solely on visual assessment of seeds, and protect the collection of seeds and related knowledge from misappropriation.

Translating the original English draft of the register into Venda and Xhosa as clearly as possible resulted in some improvements in the English version (Figure 3). For example, instead of using the word 'area' which can mean different things to different people, the word 'village'

was used. Keeping the wording simple is a must.

In August 2016, the first register (Sterkspruit) was completed, with over 50 documented seed entries; the second, to be completed soon, will register the almost 80 seed accessions in the community seed bank at Gumbu (Figure 4). Photos are to be added at a later stage.

**Table 2.** : The register for the community seed bank at Sterkspruit is written in Xhosa and English.

FARMER'S VARIETY CATALOGUE/COMMUNITY BIODIVERSITY REGISTER

Village/CSB name: Uvimba wembewu zakuda [Sterkspruit Community Seed Bank]

Date:

Code	Parameters	Description	Photos of the variety [key traits]
01	Igama lesityalo/imbewu * [Crop local/vernacular language]		
02	Igama lesingesi [English name]		
03	Uhlobo lwembewu [Variety name]		
04	Igama lithetha ukuthini [Local meaning of the name]		
05	Igama lo mfama onikizele ngembewu [Name of farmer who gave seed]		
06	Mingaphi iminyaka eyliniwa lembewu? [Number of years the variety has been cultivated by farmer]		
07	Uyifumene phi imbewu? [Where did you get the seed from?]		
08	Uhlobo lomhlaba [What is the typ of soil]		
09	Yeyiphi ilali ezilima kakhulu lesityalo? [Which village in this area is crop mostly found]		
10	Singanani isivuno kwi-hectare/morgan? [Productivity [range of yield/ha; dwarf/medium/tall]		
11	Yeyiphi inyaka yokulima nokuvuna [Planting and harvest month]		
12	Yintoni eye hluke ngayo kwezinye imbewu? [What distinguishes this variety from others]		
13	Kutheni ulima oluhlobo lwembewu? [Why do you grow this variety]		
14	Sithini isimo sokulinywa kule minyaka mihlanu? [Current cultivation status in the past 5 years]		

\* [Scientific name]: igama lenzulu lwazi.....

## A call to share experiences

Considering the limited available information about the use of community biodiversity registers, in particular by community seed banks around the world, we invite practitioners to share their experiences about the design and use of these registers. Please send your stories and illustrations to [bio-policy@cgiar.org](mailto:bio-policy@cgiar.org)

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*Photo: The seed collection of the Gumbu community seedbank (March 2016)  
Credit: Biodiversity International/R.Vernooy*

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## Contacts:

### Bioversity International

Via dei Tre Denari, 472/a  
00054 Maccarese (Fiumicino), Italy  
Tel. (+39) 06 61181  
Fax. (+39) 06 6118402  
[bioversity@cgiar.org](mailto:bioversity@cgiar.org)

[www.bioversityinternational.org](http://www.bioversityinternational.org)



Photo: Interviewing a farmer to obtain variety passport data, Sterkspruit, South Africa  
Credit: Bioversity International/R.Vernooij