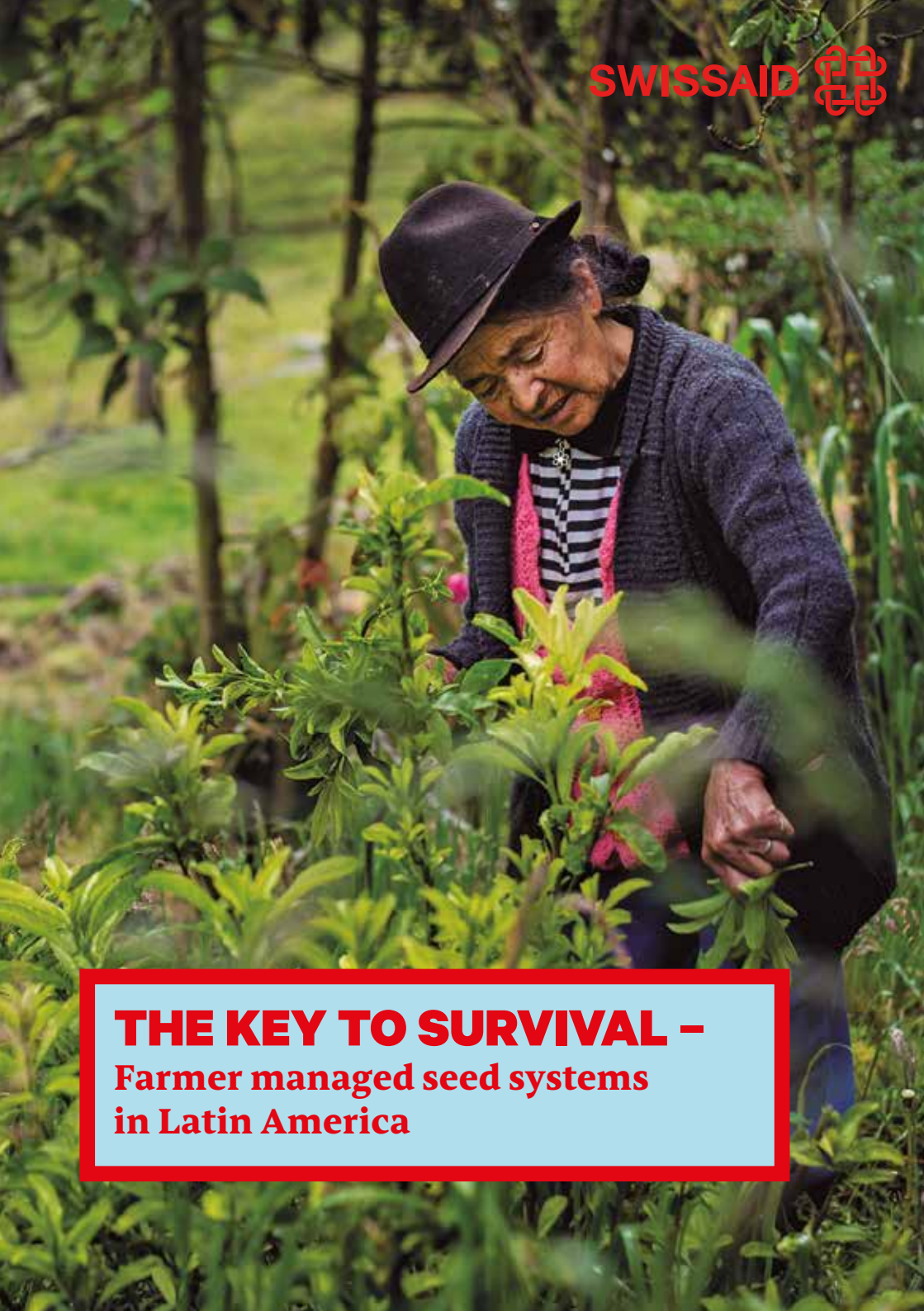

SWISSAID

THE KEY TO SURVIVAL –

Farmer managed seed systems in Latin America

Contents

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Introduction

Seeds are the collective heritage of local populations. Farmers and indigenous communities worldwide have worked for generations to breed, cultivate and exchange seeds to create an incredible variety of plant genetic resources. This diversity guarantees our nutrition in the long term, so the plants and our farming practices can adapt to changing environmental conditions. Particularly in view of climate change, this is vitally important.

Yet this seed diversity is under threat. The United Nations' Food and Agriculture Organisation (FAO) reports that, over the past 100 years, we have lost 75% of all seed varieties worldwide. Whereas peasant and smallholder farmers once produced the seeds, nowadays large multinationals increasingly control this – they dictate what appears on our plates. By registering patents they privatise the genetic resources and contaminate local seeds with their genetically modified varieties.[1] Just three agricultural corporations now control more than 60 per cent of the international market for pesticides and seeds. Their cumulative power and heavy lobbying is giving them a growing influence over political agendas. Countries introduce strict seed and plant variety protection laws, usually without consulting or informing the smallholder farmers who are directly affected. These laws mainly benefit the seed industry, and restrict the free circulation of farmers' seeds that are traditionally grown by local smallholder farmers.

The farming communities are becoming more aware of this problem. They work worldwide to retain control of our food production and to stop the depletion of agricultural biodiversity. Colombia and Nicaragua are part of the SWISSAID project 'Semillas de Identidad' conserving and encouraging the use of traditional seeds which are cultivated by farmer families and adapted to local environmental conditions. The campaign gives farmers guaranteed access to high-quality local seeds; it ensures they can be independent producers and makes a vital contribution to food sovereignty and food security. This brochure highlights SWISSAID's initiatives to preserve and promote seed diversity and offers valuable insights, especially in times of climate change, into future-oriented, agroecological farming practices across national borders.

[1] Farmers' seeds: traditional, local, indigenous open-pollinated varieties, which farmers have grown locally for many years.

Networks and Alliances: Sharing Knowledge and Mobilisation

'Semillas de Identidad' is a joint initiative set up by SWISSAID Nicaragua and Colombia for the conservation and promotion of farmers' seeds and agrobiodiversity. A key aim is to establish networks of seed savers[2] who conserve, propagate, distribute and breed different seed varieties, as well as sharing knowledge with each other. The networks work closely with the community seed banks[3] (further details below), where local seeds are loaned, exchanged and sold, and where quality standards are defined for production and storage as well as the setting up of Participatory Guarantee Systems (PGS). The networks cooperate on a national level to form politically influential alliances that lobby for farmers' seeds.

[2] Seed savers are farmers who preserve and select the local seed varieties, so contributing to seed diversity. They exchange seeds and circulate knowledge. They enjoy a special status within their local community (previously, every smallholder farmer was also a seed saver).

[3] Community seed banks: where indigenous seeds are conserved, stored, exchanged, loaned and sold locally. A decentralised, village organisation; it supplies farmer families in the locality with high-quality indigenous seeds.

Strategies of the networks:

1. The starting point is **cooperation among seed savers** in local networks or setting up community seed banks.

2. The smallholder farmers join networks and seed banks and define their **goals and principles**.

   Goals: conservation, exchange, propagation of farmers' seeds, prioritising varieties, coordination, publicity and work scheduling.

   Principles: agroecological farming and storage – without the use of pesticides, guarantee of food sovereignty, preserving and promoting genetic diversity, free exchange of farmers' seeds, protection of natural resources and traditional knowledge.

3. **Stocktaking and inventory** of farmers' seeds by the networks together with farmer families: standardised records are compiled, including evaluation or analysis of varieties available for farmer families and the village community. Creating an overview of existing seeds and preservation of genetic diversity. In some cropping systems, a corresponding survey is conducted on a national level. For example, in Colombia 400 maize varieties were identified, although 60% are rare or have already been lost.

4. **Participatory analysis** of widespread varieties: a record is made of the physiological and ecological qualities of seed varieties and their distinct characteristics. Facts about seed varieties, such as taste, suitability for storage, production cycle, yield, adaptability to climatic conditions etc., are gathered and circulated.

5. **Community-led diagnosis**: follows after the inventory; its aim is to develop strategies for the conservation and promotion of existing seeds. For instance, production planning, storage and quality of seeds, sale and purchase incl. pricing, risk of contamination by genetically modified varieties.

6. **Production, conservation, breeding, propagation and distribution**: seed savers propagate their own varieties or support others in doing so. New varieties are bred. Campaigns are launched with a mission for each network to propagate a single variety per year, and to combine this with publicity work. Campaign ideas include teaming up with restaurants and supermarkets, new recipes and PR work. Community and regional seed exchanges are also set up where smallholder farmers can present their seed varieties and exchange them with others. But the sale of farmers' seeds is also important and contributes to economically stable networks.

7. **Political lobbying for the recognition and protection of local seeds**. Together with other organisations, the 'Semillas de Identidad' forms a national seed alliance whose various local, regional and national campaigns are heard on the political stage. The alliance participates, for example, in publicising political initiatives and laws to promote farmers' seeds. Another key strategy is to motivate communities to declare themselves a 'GM-free territory' to curb the spread of genetically modified seeds.

Seed networks in figures (2018)

	Nicaragua	Colombia
Regional networks	5 regional (270 villages)	15
Regions involved	12	10
Local organisations	72	67
Seed savers	160	400
Community seed banks	410	76
Families involved	7000	3900

'Semillas de Identidad' Alliance in Nicaragua

The 'Alliance for the Promotion of Farmers' Seeds' incorporates national and local societies and farmers' organisations, as well as 410 community seed banks and their regional networks. Its priority is to highlight the issue of farmers' seeds along with other wide-ranging subjects to appeal to different organisations, to coordinate ongoing campaigns and to initiate a joint learning process. Focal areas in addition to seeds include food sovereignty, agroecology, the risks of genetic engineering in agriculture, biodiversity, healthy consumption and transparency towards consumers.

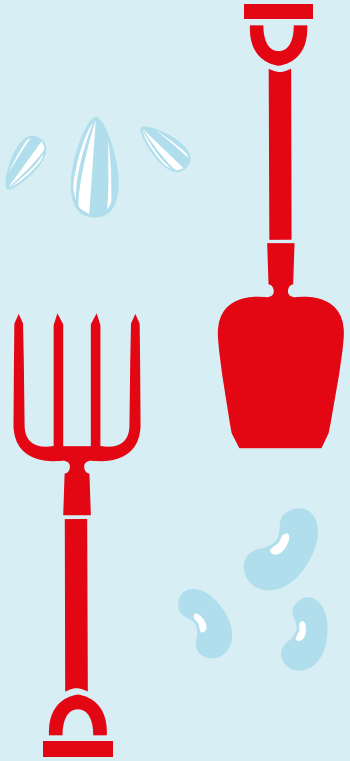
The Alliance is represented in twelve of the country's regions by independent sections with members from across the local organisations. This local and regional foothold is crucial for political lobbying, since the practical activity boosts the Alliance's credibility. The local sections nominate representatives who liaise with the Alliance's coordination group that is active on a national level. Annual action plans are devised for the regions and countrywide, and are implemented by the local organisations working with the farmers.

Promoting the use of local seeds and agroecology is among the Alliance's fields of action, as well as mobilising the relevant stakeholders, publicity and political lobbying based on factual evidence.

Fields of action of the ‘Semillas de Identidad’ Alliance

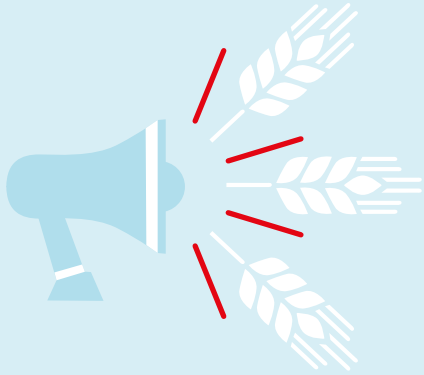
Promotion of farmers’ seeds:

- Compiling a national inventory of local seeds in cooperation with PCaC-UNAG (national farmers’ union) and smallholder farmers. This recorded extremely high diversity, but also genetic erosion. Many seed varieties were on the verge of extinction; in many regions farmers’ seeds were already non-existent.
- Endangered varieties are propagated by farmers in the Alliance and community seed banks.
- 85 local bean and maize varieties, from 45 villages (which is five municipalities) were monitored in cooperation with the Universidad Nacional Agraria in Nicaragua (National Agrarian University).
- Smallholder farmers breed new, better varieties cultivated from farmers’ seeds.
- Guidelines were devised for the agroecological production of maize and bean seeds to encourage the production of and access to good-quality seed for farmer families.



Mobilising people to exchange seeds and knowledge:

- Organising workshops and forums in local communities, regions and on a national level.
- National and regional seed exchanges as well as markets for agroecological products.
- Organising caravans to facilitate seed exchange among farmers’ organisations.

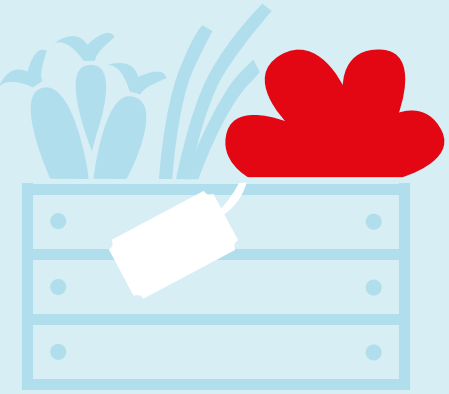


Publicity:

- Systematisation of practices and expertise to provide evidence on the importance and potential of farmers’ seeds and to resist the introduction of genetically modified seeds.
- Producing and circulating publicity material (flyers, advertising spots, radio, TV, newspapers etc.).
- Press conferences and workshops for journalists.
- Training farmers as media spokespeople in the sections: local smallholder farmers with long-standing experience and expertise on farmers’ seeds and who oppose the introduction of GMO seeds in farming. Thanks to their role and status, they are highly regarded by the media, government representatives, universities and other farming and private organisations.

Lobbying:

- Lobbying for local seeds is conducted on a local, regional and national level. Regular meetings and discussions with local mayors, parish councils, members of parliament, government and administrative authorities, as well as international institutions such as the FAO.
- Launching petitions on seed legislation and ordinances.
- Participation in consultation processes (e.g. for amendment of seed laws, biodiversity legislation, technical guidelines for agroecology).
- Initiatives to establish new policy instruments and their implementation.



Alliance successes to date

- ✓ The state recognises the importance of farmers' seeds and has set up its own programme for the promotion of local seeds.
- ✓ Legislation to encourage agroecology which also bans imports of genetically modified seeds.
- ✓ Thanks to the Alliance's work in Nicaragua, more than 135 maize varieties, 147 bean varieties, 31 other legumes, 39 millet and 16 rice varieties are now registered and protected from extinction.
- ✓ Over 400 community seed banks – each offering access, on average, for 18 families – supply over 7,000 families with high-quality farmers' seed. Additionally, 40 seed centres are responsible for *in situ* conservation[4] of a region's genetic diversity; they store multiple varieties, regularly renew them and guarantee high germination capacity.
- ✓ Over 40 new varieties were bred to suit the needs of the farmer families (resistant to arid conditions, short ripening time etc.). This work is carried out by the farmers together with the Universidad Nacional Agraria in Nicaragua: more than 50 local farmers are already working on breeding new seeds and passing on their knowledge. The results are extremely promising; several traditional bean varieties have been successfully bred so that their yield is twice as high as the national average.
- ✓ Participatory research projects of farmers' unions (PCaC-UNAG) in cooperation with the Universidad Nacional Agraria in Nicaragua raise awareness about the importance of farmers' seeds in times of climate change. Farmer families test the seeds on their fields and identify varieties that adapt well to different environmental conditions.

[4] *In situ* conservation: The conservation of seeds in their natural surroundings or in the environment where they developed their special characteristics. This contrasts with '*ex situ* conservation' where seed is preserved in genebanks outside its natural setting (CBD; SR 0.451.43).

The Alliance views its success as mostly due to its wide-ranging grassroots network, its consistent readiness to engage in dialogue, and a positive discourse that highlights alternatives and proposes solutions.

Community Seed Banks: Conservation and Promotion of Farmers' Seeds

The community seed banks are a key element of seed saver networks where the *in situ* conservation, storage, exchange, loaning and sale of farmers' seeds takes place. Their decentralised structure guarantees the supply of high-quality local seeds to neighbouring farmer families and villages. Community seed banks are a means to put the production, preservation and control of seeds and the acquired knowledge back in the hands of local farmers. This is the opposite approach to privatisation and state-controlled certification that often excludes farmers' seeds. The community seed banks accept open-pollinated[5], local[6] varieties to encourage ecological farming that is adapted to climate change conditions. Hybrid seeds or genetically modified seeds are not accepted in the seed banks.

[5] Open-pollinated: after pollination by natural means, seeds can be re-sown and will produce plants with the same characteristics as their parents ('true breeds').

[6] Local seed varieties are, on the one hand, indigenous varieties and, on the other hand, seeds that have already been cultivated locally for many years.

Most smallholder farmers in Colombia and Nicaragua have consistently had negative experiences with industrial, certified seeds (e.g. poor germination capacity). While government promotional schemes often distribute these seeds free of charge, they are generally unsuited to the prevailing ecological conditions. But the promise of progress and high yields gave industrial seeds a good reputation. SWISSAID's support for the community seed banks achieved a paradigm change among the rural farming population. Today, farmer families defend their seeds, which are well-adapted to the local climate and give stable yields, and their right to be allowed to sell their own seed varieties.

The processes involved in setting up and managing the seed banks have a positive effect on village organisation. New jobs can be created and income generated. This is especially the case where farmers specialise in breeding seeds, apply selection breeding and thus create new varieties. Seed production can also offer young people an alternative to migration towards the cities.

The work of the seed banks has led to the rediscovery and propagation of varieties that had vanished. The efforts to breed new varieties and swapping seeds between seed banks and seed exchanges means that agrobiodiversity can be expanded. The focus on basic foods such as rice, maize, potatoes and beans improves food security for the farmer families. Agroecological cultivation and the storage of farmers' seeds also raises food quality. These varieties also have a close connection with farmers' indigenous and rural culture, since the seeds are used for the production of various traditional foods.

Tasks of the community seed banks:

1. Definition of the **organisation structure:** drawing up internal rules, appointing a village committee and coordinator.
The normal procedures are as follows: the seed banks loan smallholder farmers a certain quantity of seeds; the farmers hand back twice the amount after the harvest. This adds to reserves and more and more families can be supplied. The seed banks' operation is assured over the longer term, even if the harvest gives poor yields in a particular year.

2. Keeping various **records:** seed producers, inventory and description of varieties produced for the seed bank, checking of incoming and outgoing seeds, purchase and sales, seed credits and payments by producers, quality control.

3. Compiling a **guideline** for agroecological production of seeds without pesticides and chemical fertilisers, harvest and storage, incl. agreements for loans, exchange and sale.

4. **Accounts** (expenditure, income), prices of seeds depend on production costs.

5. **Quality control:** measuring moisture content and germination rates (see example below) of incoming seed, control of physical impurities (maximum 5% allowed by the seed bank) and sorting and removal of damaged (due to disease, insects) or malformed seeds.

6. **Labelling** of seeds: producer name, variety, quantity, production location, collection/harvest date, anticipated germination rate.

7. **Natural treatment** of the seed to eliminate pests and diseases (see example below). This also promotes successful germination of the seed.

8. **Drying** (if required) and storing the seed. Ideal moisture content is 10–13%. Depending on the climate, solar-powered driers are used.

9. **Supporting** the farmers to breed improved local varieties. Even simple methods like selecting the 'right' plants can achieve a rapid improvement of seed quality.

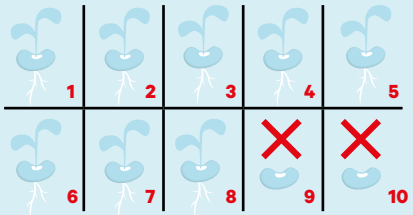
10. **Sharing knowledge and experience:** circulating information about farmers' rights (e.g. Article 9 of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)) and right to food (higher than intellectual property rights).

11. **Maintaining contacts** with supportive organisations, national networks and media.

Measuring germination rates:

A seed sample is sown at regular intervals; checks are made to determine how many of the seeds germinate.

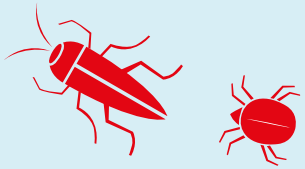
Germination rate:
80% = 8 out of 10 seeds germinate.



Technical requirements of seed banks:

Community seed banks must be built to ensure, as far as possible, a cool and constant internal ambient temperature.

To regulate the temperature and moisture, it is important to have the right construction materials (e.g. mud or loam, thatched roof), size (preferably small), location (shady) and storage containers (e.g. small clay pots).

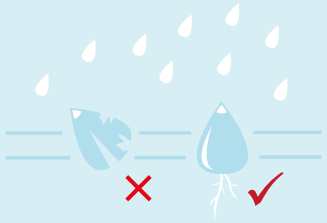


Methods to eliminate seed pests and diseases:

- **Freeze** seeds for 5–8 days
- Store seeds **oxygen-free** (e.g. with a candle in a sealed container)
- Treat seeds with **methane**: use a hose to circulate gas from fermented manure (ensure adequate ventilation to avoid risk of explosion)
- Coat seeds with **ashes, silica gel, fired clay or chalk powder**
- Treat seeds for 15 minutes in a **10% chlorine solution**, then rinse thoroughly and dry
- Soak seeds in **chamomile, valerian or garlic and chilli infusion**; no need for drying afterwards
- **Disinfect** with organic products like Bacillus thuringiensis or Trichoderma

Farmers' seeds: A response to climate change

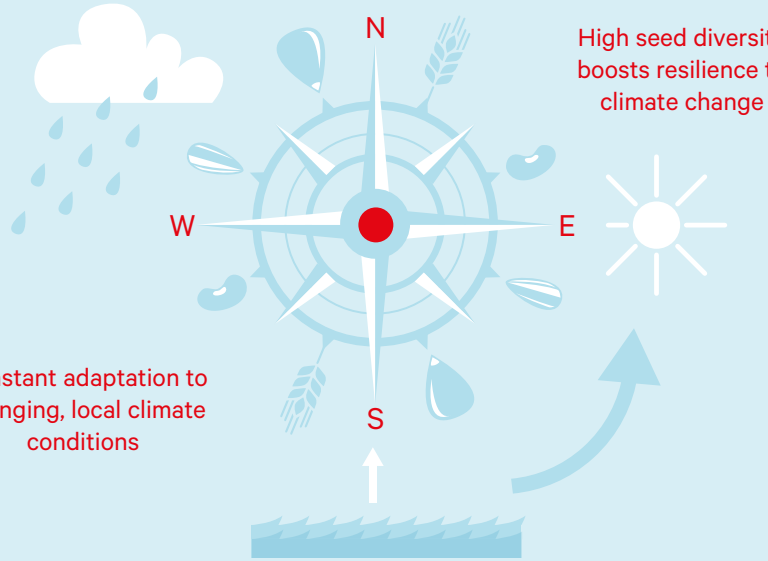
Climate change presents immense challenges for agriculture. Droughts, extreme temperatures, irregular and unpredictable rainfall make it more difficult to produce food.



Farmers' seeds are a key factor in dealing with climate change. In Nicaragua, for example, smallholder farmers are breeding new varieties that are better suited to changed climatic conditions.

Farmers' seeds...

- ✓ are open-pollinated and naturally sown again every year.
- ✓ are conserved in situ and remain in their natural environment, in contrast to gene banks.
- ✓ are locally bred and locally grown, contributing to seed diversity.
- ✓ are heterogeneous and genetically diverse.
- ✓ are suited to agroecological, diverse cultivation and not monocrops. That makes them more resistant than industrial seed.



Participatory Guarantee Systems (PGS): Seed Quality Assurance in Colombia

In Colombia, Resolution 3168 of 2015 regulates handling, certification and bringing seeds to market. Those who want to produce or sell certified seeds must comply with the specified quality standards such as grade purity, health and germination capacity, and they are also required to register. The relevant state authority can carry out checks at any time. The law also states that registered producers are permitted to circulate only certified seeds. This state-imposed and supervised certification disregards the rights of farmers[7]; it prevents the free circulation of farmers' seeds and jeopardises the food sovereignty of the Colombian population. In 2010, for example, 2,200 tonnes of rice seed were confiscated and some of it destroyed by the Colombian government. Resolution 464 'Agricultura Campesina Familiar y Comunitaria' of 2017 establishes new conditions: it recognises the farmers' seeds and grants farmers the right to conserve, reproduce and sell their seeds without submitting to state control and certification.

[7] Article 9 of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) as well as the UN Declaration on the Rights of Peasants and Other People Working in Rural Areas.

Participatory Guarantee Systems (PGS) offer an alternative to state seed certification. PGS were developed in the 1990s. They are regarded worldwide as an alternative model to expensive organic certification by third parties, which also makes them accessible to smallholder farmers. PGS are quality assurance systems that apply for the product and the process – i.e. production, distribution, sale and consumption. They are mainly aimed at the local market and rely on active participation of farmers, consumers and other stakeholders. They instil trust in agricultural production, so reinforcing dialogue, social networks and a sense of shared responsibility; they also encourage the intensive exchange of knowledge and learning processes. PGS are important tools for devising clear quality aims for agroecological production and the right to the recognition of agricultural products that are grown according to these standards.

Participatory Guarantee System (PGS) structure

1. Cooperation of grassroots organisations: farmers' organisations + consumers
2. Determination of procedures, norms and standards by participants
3. Documentation of the system and its procedures
4. Mechanism to guarantee that producers comply with agreements
5. Defined and clear consequences for non-compliance with agreements
6. Quality guarantee with a quality seal, e.g. label or stickers

Written documentation for PGS

Seed production	Operation of seed bank	Seed storage	PGS
Production report	Internal rules for operation of seed bank	Guidelines for storage of seeds	Manual
Information on pests and diseases	Log sheets	Registering origin and production system of seeds	
Inventory of seeds produced	Reports for germination test and vitality	Register of seed producers and seed sales	

SWISSAID Colombia, together with the Movimiento Agroecológico de América Latina y El Caribe (MAELA), has developed a PGS system for seeds under the project 'Semillas de Identidad'. This system is being used successfully. Thanks to the participation of farmers, seed savers, agroecology promotors, community seed banks and seed saver networks, various organisations and consumers, PGS were used to create an evaluation tool for farmers' seeds. Its main element is a guarantee of compliance with quality standards. Various measures ensure that jointly defined norms and procedures are followed. It is important to keep a written record of the practical procedures and results. Product quality can be marked with labels, certificates or underpinned with contracts. The entire process is monitored by the various seed saver networks that are involved.

Monitoring process of the seed saver networks

Internal monitoring by community seed banks

Designated seed bank agents organise inspection and monitoring of farmers producing seeds

↓

Documentation of inspections by seed banks

Data entry forms from inspections

↓

Quality inspectors

Auditing of documents, checks on compliance with the process

↓

Authorising committee

Auditing: approval or sanctions | Compiling a file listing PGS seed producers

↓

Issue of quality label by national committee

PGS-endorsed quality norms:

One of the most important stages is the participatory definition of the quality criteria which must be guaranteed by the production of farmers' seeds. These aspects are established together with the community seed banks. Under PGS, farmers' seeds must fulfil five quality norms that accord with the 'Semillas de Identidad':

1. **Health, robustness and yield:** seeds must be robust, give a good yield, have a high germination capacity and be free of contamination and damage (e.g. by pests and disease).
2. **Origin and adaptation:** seeds must be adapted to local conditions or be local indigenous seeds (not seeds protected by intellectual property rights).
3. **Reproduction capacity and ecological cultivation:** seeds must be ecologically cultivated and open-pollinated or 'true breeds' (e.g. no commercial hybrids).
4. **GM-free:** seeds must be free from contamination by genetically modified seed.
5. **Connection to seed banks:** seeds must be stored in community seed banks with the corresponding technical and expert supervision.

Quality control based on sub-criteria

The five quality norms are described in more detail on the basis of additional criteria for the PGS to monitor and award a quality guarantee. The main stakeholders are the local farmers working for the community seed banks.

Sub-criteria:

GM-free seeds:

- ✓ The incidence of planting areas with GM plants is well known – the risk of contamination outside those areas is small.
- ✓ If contamination is suspected, sampling tests are carried out.

Local farmers' seeds:

- ✓ A farmer must plant the variety
- ✓ Origin and history of the variety is well known
- ✓ The network determines how many years it takes for a variety to be considered local. The minimum period is three years.

Ecological cultivation and open pollination:

- ✓ Spatial distance from conventional production areas
- ✓ Avoidance of crossing varieties by separate spacing and different growing seasons
- ✓ Open pollinated (insects must be abundant)
- ✓ No chemical pesticides
- ✓ Use of high-quality organic fertiliser, adapted to the respective needs of the seed cultures
- ✓ Use of techniques which are good for soil conservation

Outlook

Nothing less than the future of our farming and our nutrition hinges on seed diversity. The 'Semillas de Identidad' ensures that, in Colombia and Nicaragua, seeds remain in the hands of local farmers and that diversity can be preserved. In view of the huge loss of agrobiodiversity worldwide, the disastrous effects of climate change and the growing monopoly held by a handful of multinational corporations, this task must be afforded the highest priority. 'Semillas de Identidad' proves that agroecologically cultivated, traditionally grown local seeds are extremely well adapted to the different local climatic and ecological conditions and that families' food security is assured. It also satisfies the quality requirements of the market and the farmer families who produce seeds for their villages – this is proven by innovative approaches such as the Participatory Guarantee System (PGS). Through the community seed banks and their networks, the 'Semillas de Identidad' makes an enormous contribution to food sovereignty and the conservation of plant genetic resources. It is women in particular who select the best seeds to feed their families and for the local market. Their efforts preserve seed diversity which is the collective heritage of local peoples. This model has a future – in communities around the world.

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