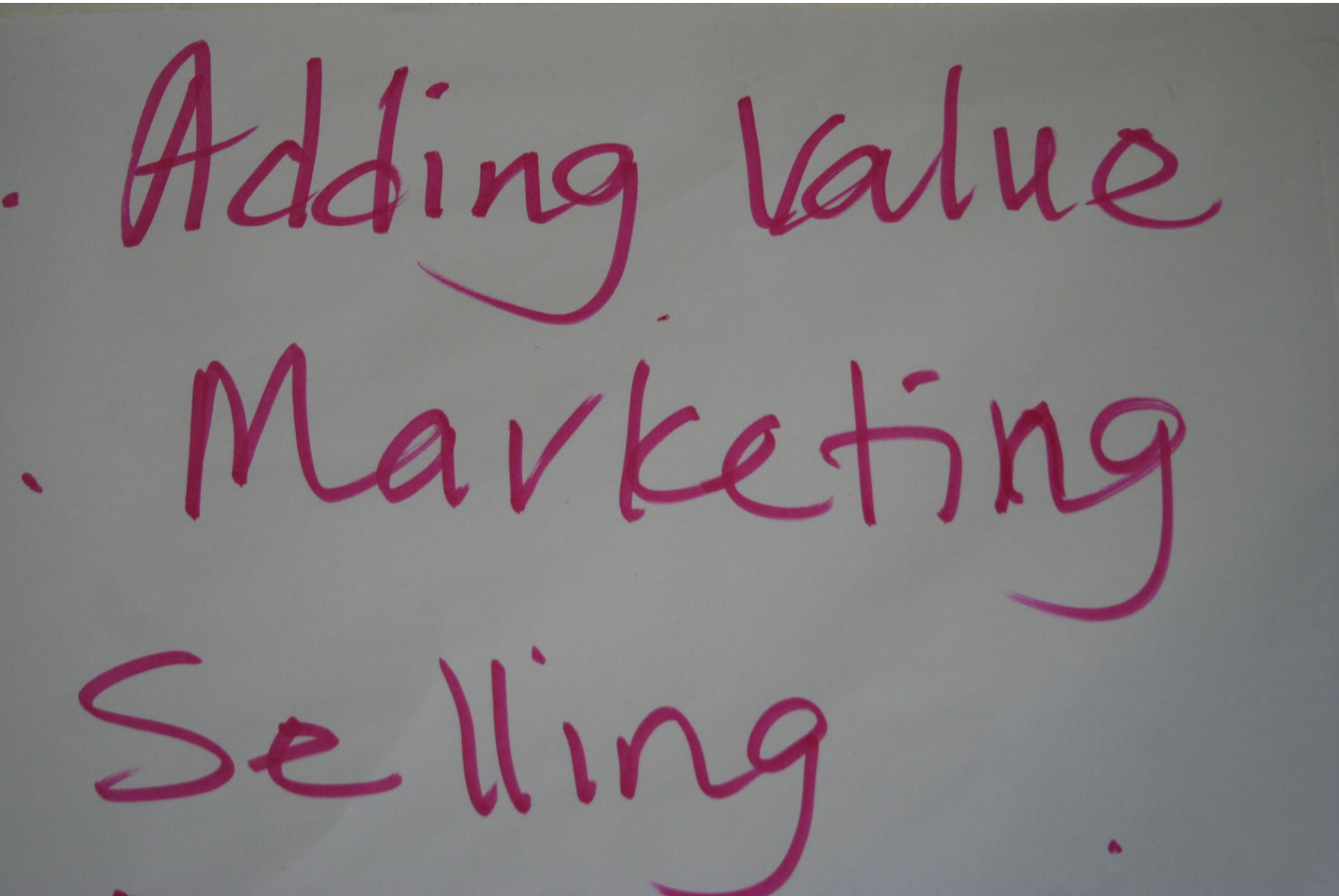
Policy advice to enhance smallholder food security with a focus on tropical superfruits

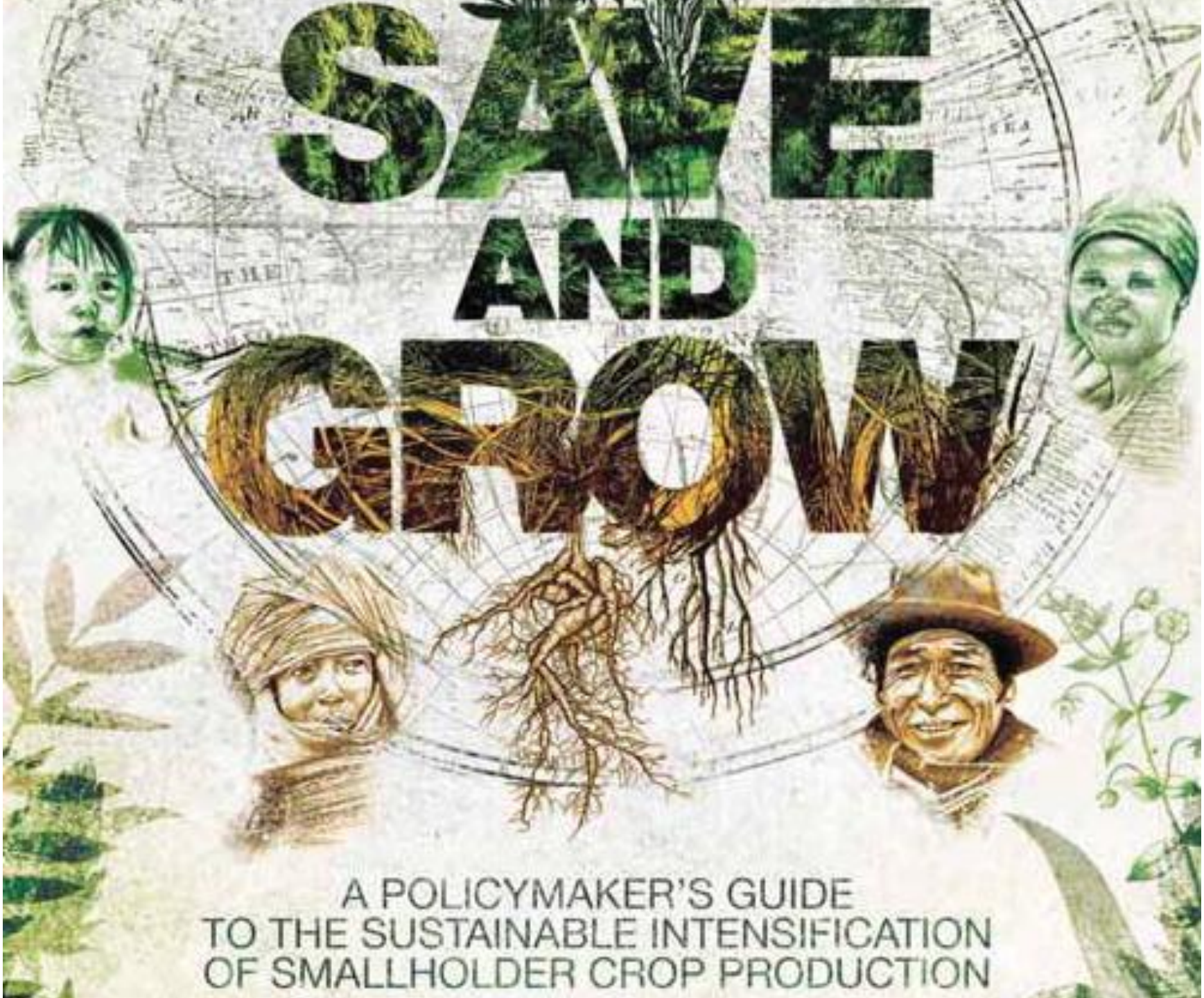
by Mario Arvelo


FAO
FIAT PANIS

superfruits

(Seen at an FAO-sponsored workshop in Sierra Leone)




SAVE
AND
GROW
A POLICYMAKER'S GUIDE
TO THE SUSTAINABLE INTENSIFICATION
OF SMALLHOLDER CROP PRODUCTION

Trends in Conservation and Use of Plant Genetic Resources Around the World

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Trends in Genebanks

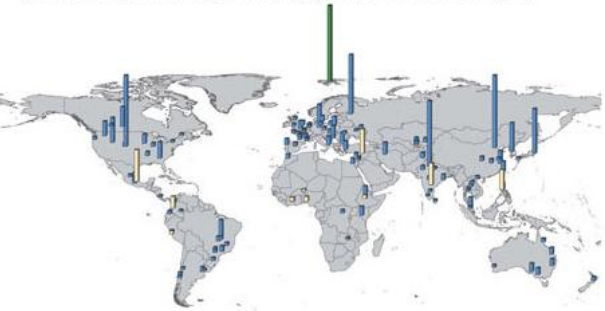
The number of genebanks and their collections have increased. National genebanks conserve about 6.6 million of the total 7.4 million accessions held worldwide. About 45% of the national holdings are conserved in only 7 countries (Brazil, China, India, Japan, Mexico, Russian Federation and the USA) down from 12 countries in 1996. Of the 7.4 million accessions currently maintained globally, about 25-30% are distinct and not duplicates.

There are now more than 1 750 individual genebanks worldwide, about 130 of them hold more than 10 000 accessions. Some 55% of all accessions held in genebanks globally for which the country of origin is known are indigenous, i.e. they originated in the country where the collection is maintained.

In the last 12 years the number of species conserved in *ex situ* national collections has seen a 60% increase of which a significant proportion are crop wild relatives species.

Nonetheless these, together with neglected and underutilized crops, are still insufficiently represented in *ex situ* collections.

Geographic distribution of genebanks with holdings of >10 000 accessions (national and regional genebanks in blue; CGIAR centres genebanks in beige; Svalbard Global Seed Vault in green)



Source: WIEWS 2009; Country reports; USDA -GRIN 2009

Regional and sub-regional distribution of accessions stored in national genebanks (international and regional genebanks are excluded)

REGION	SUB-REGION	NUMBER OF ACCESSIONS
Africa	East Africa	145 644
Africa	Central Africa	20 277
Africa	West Africa	113 021
Africa	Southern Africa	70 650
Africa	Indian Ocean Islands	4 604
Americas	South America	687 012
Americas	Central America and Mexico	303 021
Americas	Caribbean	33 115
Americas	North America	708 107
Asia and the Pacific	East Asia	1 036 946
Asia and the Pacific	Pacific	252 455
Asia and the Pacific	South Asia	714 562
Asia and the Pacific	Southeast Asia	290 097
Europe	Europe	1 725 315

Trends in Preserving Local Diversity

Local PGRFA diversity found in farmers' fields or *in situ* is still largely inadequately documented and managed. Only a fraction of this diversity is conserved in genebanks. There are about 50 000 to 60 000 species of crop wild relatives worldwide of which about 700 are of the highest priority for conservation and sustainable use as they represent the primary and secondary genepools of the world's most important food crops.

Between 1996 and 2007 the number of protected areas have grown from approximately 56 000 to 70 000 and the total area covered expanded from 13 to 17.5 million km2. Nonetheless, many important crop wild relatives are still found outside these areas.

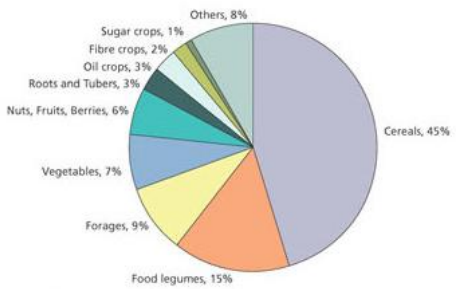
Traditional Crops are Finding New Uses

Instances of new uses for food crops include the use of cassava for the production of biodegradable plastic in India and the use of cocoa butter for making cosmetics in Ghana.

In a newly evolving trend, plants are now being grown solely for biofuel production. Varieties of willow, poplars, *Miscanthus* spp. and switchgrass are being bred for biofuel production in the USA as well as in European countries.

The interest in finding new uses for traditional crops has expanded, spurring greater investments in niche markets for regional and local products and providing opportunities to strengthen local economies.

Contribution of major crop groups to total *ex situ* collections



Source: The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture. FAO, Rome, Italy, 2010, p. 88

The Role of National and International Programmes

Crop Trends

The sustainable use of PGRFA is realized through seamless linkages between crop improvement, seed production and delivery systems that ensure that farmers obtain adequate quality seeds and planting materials of improved varieties in a timely manner.

Unfortunately, in the national programmes, the overall capacity for plant breeding is in decline. The major constraints are lack of skilled human resources, funding and facilities.

Therefore, it is urgent and necessary to strengthen national capacities as well as effective partnerships at national, regional and international levels. Research and development, information exchange and the implementation of relevant policies and legislation in developing countries must be increased.

There has to be a much greater emphasis on forging stronger links between plant breeding, seed systems and conservation to make available climate-ready crops and seeds to farmers worldwide.

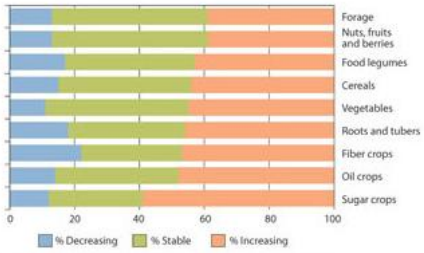
Seeds

Sufficient quantities of quality seed must be available to farmers at the right time and at affordable prices. There has been an increase in the volume of the international seed trade. The global seed market, worth USD 30 billion in 1996, is now valued in excess of USD 36 billion. Five multinational companies account for over 30% of the global market that caters mainly to the most profitable crops such as hybrid cereals and vegetables.

However, for farmers in many developing countries, access to improved varieties and quality seeds is critically limited as investment by the public sector in seed production is decreasing significantly.

Increasing focus on community-based production and supply systems, and seed enterprises that increases the production of quality seeds at the local level needs more attention.

Trends in plant breeding capacity: percentage of respondents indicating that human, financial and infrastructure resources for plant breeding of specific crops in their country had increased, decreased or remained stable since the first report on the State of the World's Plant Genetic Resources for Food and Agriculture



Source: NISM 2008 (available at: www.pgrfa.org/gpa). The figures are based on the response of 404 plant breeders from 49 developing countries to a question on the current trend within the stakeholders' organization in terms of capacity to breed specific crops or crop groups.

Trends in plant breeding capacity: percentage of