

FARMING MATTERS

Formerly known as LEISA Magazine



Co-creation of knowledge

- Learning from citizens ■ Farmers inspire their peers
- A farmer-NGO-scientist synergy

ANNOUNCEMENTS

In memoriam: **Bertha Cáceres**

Bertha Cáceres, a hugely influential indigenous and peasant leader, grassroots feminist, environmental activist and winner of the 2015 Goldman Environmental Prize, was murdered in her hometown of La Esperanza, Honduras, on 2 March 2016. It is a tragic ending to the life of this courageous woman. Bertha Cáceres was the co-founder and general coordinator of the National Council of Popular and Indigenous Organizations of Honduras (COPINH). Bertha had been repeatedly threatened with her life for her peaceful but persistent opposition against the Agua Zarca Dam on the Gualcarque River. This dam threatens local people's major source of water and food. COPINH demands an end to this dam and a full, independent investigation of Bertha Cáceres' assassination. Many people worldwide are joining these calls, demanding an end to the repression of indigenous and peasant movements in Central America. Bertha Cáceres has inspired many people as an indigenous woman raising her voice in the defense of community territory, land and water. Our condolences go to Bertha's family, to her community, and to all who joined her in this struggle.



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Growing our cocoa, raising our voices



“**M**y name is Léocadie Voho. I am 51 years old. I have seven children and 11 granddaughters. I live in Tienhoula, a prefecture of Duékoué, in west Ivory Coast. When I joined 24 other female cocoa farmers in discussing our position as women in our country's certified cocoa sector, we could really see our situation with new eyes.

We worked with researchers, film-makers and the Fairtrade organization to make a film about our work and our lives. We first started filling in a seasonal calendar, including our daily schedule. When we compared our calendars, we realised that we really work a lot. But then we saw that the real problem is not how much we work but the price of cocoa and the money we get for it. When we sell the cocoa, I should have my share to feed my family. But the men sell the cocoa and I get nothing. Trade isn't fair after all.

We learned how to shoot with the video camera, and how to make a script. We made a script about our experience with cocoa and how the money doesn't make it home. It was in making this film that

we realised that we could change this situation. In practice it means talking to your husband or son about the changes you want. We also want to persuade the men to let us have our own land to cultivate-- that would make a difference!

Making this film gave us the opportunity to discuss our possibilities with each other, and with different kinds of people with different ideas. I hope that this film can motivate and mobilise all the women in our situation to make changes in their lives. By sharing our experiences about our situation in cocoa production we created new knowledge together about how to make change. We not only learned how to film but also how to raise our voices.

Interview by **Margriet Goris** independent researcher at Wageningen University (The Netherlands) and documentary film maker. Photo: Margriet Goris. Watch Léocadie Voho and other female cocoa farmers in the self-made drama series 'Growing our Cocoa, Raising our Voices' (<https://vimeo.com/134144148>)



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Strawberry fields forever

A farmer and a scientist were the motor of change in California's strawberry sector over the past 30 years. This partnership was initially seen as too radical. But the effectiveness of their collaboration has not only proven skeptics wrong, but has also changed and evolved collective understanding of sustainability.



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Interview: "Agroecology is an epistemological revolution"

Agroecology as a science, movement and a practice is a radical shift in our relationship with knowledge, says Victor M. Toledo. As agroecology has gained steam, and scientists began to value farmers' knowledge, there has been an 'innovation in attitudes'.



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Climate change seen through indigenous worldviews

Indigenous worldviews give rise to different ways of understanding climate change. The Adivasi life cycle in India was developed through a co-creation of knowledge by youth and elders who were seeking to resist externally imposed measures to combat climate change.



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Rescuing our maize: Building a network

In defense of seed sovereignty in Jalisco, Mexico, farmers have built a strong network to protect maize, a major component of their cultural heritage. Utilising many 'farmer to farmer' knowledge-sharing techniques, they are building a movement for autonomy.

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Co-creation in the practice, science and movement of agroecology

Knowledge building is central to agroecology rooted in family farming. But why? What type of knowledge, and whose knowledge is mobilised? This issue of Farming Matters explores what we really mean by co-creation of knowledge in agroecology, why it is so essential for today's challenges, and how it takes place around the world.

Jessica Milgroom, Janneke Bruil and Cees Leeuwis

In agroecology, farmers continuously build situation-specific knowledge that allows them to develop under unpredictable and changing circumstances. There are no fixed prescriptions in agroecology about how to produce, process, market or store food, feed, medicine and fibre. Rather, different practices work in different ways depending on each specific context and ecosystem. This is why agroecology is knowledge-intensive and why the combination of different types of knowledge is so essential in agroecology.

Knowledge co-creation is especially relevant and urgent in the context of climate change. Developing climate resilient agriculture is all about building knowledge related to locally rooted adaptation strategies. Farmers' knowledge of seeds, land, water and other local resources are absolutely central in this process.

Solutions to problems or ways of improving production emerge through experimentation, practice and learning with others, especially because different types of actors generate different types of knowledge. Bringing people with various perspectives, experiences and questions together can facilitate creativity and innovation. Co-creation of knowledge happens when such *new* knowledge emerges from sharing, learning and working together with other people.

The various contributions in this issue take a look at the following questions: what kind of knowledge are we creating in agroecology? How can learning and sharing turn into co-creation of knowledge? How can farmers become equal players in co-creation of knowledge with scientists, policy makers and others? How is co-creation relevant for the agroecological movement?

What knowledge and whose knowledge? In agroecology, knowledge about the way the farming system works as a whole is important. Often, innovation requires knowledge about the relationships among elements of the agroecosystem, for

An artistic representation of co-creation of agroecological knowledge in Brazil. Photo: Edith van Walsum





Using new technologies for sharing knowledge in India. Photo: Supriya Biswas

example insects, pests and companion plants (see page 10). Or -in the social world- between farmers' preferences and diverse varieties of crops (see page 14).

Questions and uncertainties are also a highly relevant form of knowledge; knowing what we do not know can shape further inquiry and courses of action. Both in the experiences from Mexico and from India people came together and organised around a quest for knowledge (pages 22 and 26). This is also evident from the article on page 37 which points at our lack of knowledge about effective policies that work for agrobiodiversity.

And in order to act, we need knowledge about how (through what methods and procedures and skills) a desirable outcome such as higher yields, healthier soils or better nutrition may be achieved. Last but not least, co-creation may involve knowledge about people involved in the process. This is relevant because innovation often requires alignment between people who depend on each other to get something done.

While scientific knowledge aims to be largely explicit, a lot of relevant knowledge and skill in agriculture is tacit, implicit or hidden in (women) farmers' practices and in their heads. Bringing it to the table may require deliberate exploration, elicitation and discovery. It is therefore critically important to invest time and resources in informal interaction and the facilitation of high quality dialogue. Experiences in Rwanda and the Netherlands (pages 32 and 34) indicate that in these processes, it is necessary to first establish trust among different actors.

Furthermore, as the article on pages 40 to 43 points out, questions about *whose* knowledge 'counts', and why this matters is a fundamental one - but rarely addressed. As a result, practical knowledge held by food producers is often grossly unrecognised. This may especially be the case for women's knowledge, even

though they make up 70% of the farmer population worldwide (page 9).

Beyond individual learning

"The diverse knowledge and ways of knowing of our peoples are fundamental to agroecology. We develop our ways of knowing through dialogue among them"
- Declaration of the Nyéléni Forum on Agroecology, 2015

What distinguishes co-creation of knowledge from individual learning is the collective generation of new knowledge. Agroecology blends different types of knowledge: traditional, indigenous knowledge, farmers' knowledge, and scientific knowledge, to name a few. Each of these types of knowledge holds different treasures. Indigenous practices often hold clues about innovative ways of doing things, based on years and years of experience, such as how to manage pests using local, available resources. Farmers' knowledge can contribute context-specific insights about a particular type of seed, planting dates, or soil resource. Scientific knowledge can inform us about processes and phenomena that are more difficult to see and comprehend with the naked eye. Knowledge held by urban citizens provides insights about new food cultures and practices. Bringing together these types of knowledge has led to ground-breaking insights in the field of agriculture. The partnership experience of farmer Jim Cochran and academic Steve Gliessman (page 10) is a good example of this.

As described eloquently by Elizabeth Mpofu (page 9), co-creation of knowledge occurs regularly in day-to-day life as people ask and discuss questions in an attempt to resolve problems, and as they jointly put solutions into practice. From such a process, and this



Participatory Rural Appraisal in China. Photo: Jian Ren

often happens in agroecology, innovations can emerge that are not only technical but that are also social or political in nature. Innovation often emerges over time and requires repeated meetings and sharing. As an experience in Honduras (page 14) indicates, a long lasting commitment between the actors is therefore fundamental for these processes.

Co-creation between practice and science

A very specific and important, but delicate type of knowledge co-creation happens between farmers and scientists, as many of the articles in this issue demonstrate. This has a long history. When co-creation of agricultural knowledge is mentioned today, the first kind of co-creation that most people think of is that between scientists and farmers. Already in the 1940s, British soil scientist Sir Albert Howard wrote his famous book 'An Agricultural Testament' in which he beautifully describes different systems of compost-making as practiced by Indian farmers. It became more widely recognised in the 1970s that working together with farmers could improve the relevance of agricultural research and the likelihood that its results would reach farmers. A plethora of participatory methods have been developed since then and nearly 50 years of agricultural research ensued that involved farmers in one way or another.

While many of these processes remained top-down, and farmers were only nominally consulted or involved as 'beneficiaries', more radical thinking and practice emerged in which farmers were seen as researchers in their own right. These notions were at the roots of the birth of ILEIA and its magazine in 1984. This kind of thinking manifested itself in, for example, the Farmer to Farmer methodology which originated in Central America, and many other initiatives which together formed the basis for the agroecology movement. At the heart of many such approaches is Paulo Freire's adagio that poor and exploited people can and should be enabled to analyse and change their own reality.

And this work continues to evolve. This issue of Farming Matters moves away from the lab-to-land mentality in knowledge sharing and looks at existing

practices and processes in which farmers truly engage in processes of co-creation. The stories presented on these pages indicate that farmers can be central players in co-creation of knowledge. Although it is still not the norm, there are cases where farmers have a role in setting the research agenda, carrying out the research and analysing the results (see for example page 26).

As top-down processes are increasingly met with bottom-up resistance, perhaps one of the most remarkable changes that can be noted over the last decade of participatory research is the co-creation of a new attitude towards the role of farmers in co-creation processes, from both the farmers and the scientists (Interview with Victor M. Toledo page 18).

Creating knowledge in the movement

Agroecological movements are growing stronger around the world. Much of this movement building evolves around knowledge sharing about identity, history, territory, culture and strategy, leading to collective advocacy and organisation as well as other types of political use of knowledge in interactions with others. The Nyéléni processes that bring together various actors around food sovereignty and agroecology are testimony to the strength that can be generated by knowledge co-creation processes (page 17).

Another example can be seen in India (page 22), where communities are building resilience to climate change through an innovative assessment of the impacts of and responses to climate change in their region. This has given them strength to stand up against the externally imposed REDD (the UN programme for Reducing Emissions from Deforestation and Forest Degradation). Three authors from Coventry University argue (page 40) that fundamentally rethinking and reshaping the co-creation of knowledge can advance the struggles of social movements who are striving for agroecology and food sovereignty.

This issue of Farming Matters offers a rich palette of practices of knowledge co-creation in agroecology. Around the world, people are generating insight into some of the key factors that can strengthen co-creation processes. As agroecology is gaining momentum as a practice, a science and a movement, further exploration of these factors is necessary. The crucial next step will be to embed these insights firmly in fundamentally new types of practice, policy and research for healthy food systems based on farmer-led agroecology.

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Learning is a lifetime activity. Nowhere is this clearer than in agriculture, and especially among women farmers. Being responsible for over 70% of agricultural production on our continent, we farm through knowledge sharing. In complex and closely knit social groups, starting in early childhood, knowledge is birthed, nurtured and passed on. This knowledge relates to a wide range of topics, such as seed selection and storage, farming methods, nutrition and traditional medicine.

Our grandparents used to tell us: '*chara chimwe hachitswanyinda*', meaning: 'for a person to achieve his or her goals they need help, ideas and knowledge from other people'. So we share knowledge as we walk to fetch water, gather firewood, during traditional ceremonies and as we take our children to clinics. Every space in our community is a space to learn and share what one knows.

As women, despite historical negligence because of patriarchy, we have used co-creation of knowledge to assert our rights and to strengthen the position of rural women. We formed groups and started to engage in farmer-to-farmer learning. We organized seed fairs to share the diversity of our own native indigenous seeds and we organised food fairs to showcase our traditional foods. This enabled us to link with consumers. By sharing ideas and sharing knowledge we joined other women's organisations and lobbied together for favourable agricultural policies. This helped us to better understand how government structures operate.

As we women are responsible for producing enough food in times of climate change, we decided to work with other farmers and progressive researchers to co-create new ways and means of farming. After many years of perfecting our ways of farming, and because our social, ecological and economic contexts are changing, scientists and policy makers are beginning to embrace our knowledge. They see the value of our methods of ecological farming, now called agroecology, that is rooted in indigenous knowledge systems, and seeks harmony and respects mother nature. Our way of farming is currently being propagated as a way to solve the climate crisis and reduce poverty. Through knowledge co-creation with progressive scientists and many others, we as women farmers are working towards achieving food sovereignty (not food security) and producing enough food for our families.

Elizabeth Mpofu (eliz.mpofu@gmail.com) is the General Coordinator of La Via Campesina and the chairperson of the Zimbabwe Organic Smallholder Farmers Forum (ZIMSOF).



Women farm through knowledge sharing



Strawberry fields forever

A farmer-researcher partnership

Professor Steve Gliessman and farmer Jim Cochran are among the movers and shakers of the strawberry sector in California. Since the 1980s they have been experimenting with sustainable ways to grow strawberries and with alternative food networks. Committed to the agroecological transition, they built a powerful farmer-researcher partnership that was groundbreaking for farmers, academia and the strawberry industry as a whole.

Steve Gliessman and Jim Cochran

The central coast of California, with its Mediterranean climate, is an important strawberry growing region. Strawberry production here, as in many other locales, is highly dependent on expensive, energy-intensive, and environmentally harmful off-farm inputs.

The current system of industrial, conventional

strawberry production in California can be traced back to the early 1960s. Before that time, growers treated strawberries as a perennial crop, rotating each field out of strawberries for several years. However, when the soil fumigant methyl bromide (MeBr) was introduced in the 1960s, growers started to manage strawberries as an annual crop, planted year after year and fumigated with this pesticide on the same piece of land. In the

early 1980s, as interest in organic food became a potential market force in agriculture and issues of pesticide safety and environmental quality came to the fore, farmers began to respond. For 30 years, the University of California, Santa Cruz has been working with farmers to study this process.

In this context, a particularly fruitful partnership emerged between the two of us: an academic (Steve Gliessman) and a strawberry farmer (Jim Cochran). It was serendipitous that Jim's first plantings at Swanton Berry Farm in Davenport, California were just over the fence dividing his field from the home Steve was living in at the time. Over that fence our talk about the transition to organic strawberry production led to the first side-by-side comparative trial. At Jim's farm, our thinking and our practices evolved, using his land, varieties and practices, his workers, and many of his resources.

This article tells the story of our journey of co-creation. From this collaboration, grounded theory about levels in the transition process to sustainability emerged as our thinking evolved. We believe these levels provide useful insight into how to scale out or scale up the agroecological transition process, as well as the changing role of science (see table on page 13).

Level 1: Input reduction Even before our partnership began, extensive research was carried out to discover more effective ways of controlling pests and diseases so that industrial inputs could be reduced and their environmental impacts lessened.



An agroecology researcher and UCSC students gather data from the comparative study of organic and conventional strawberry management, at Jim's Swanton Berry Farm, Davenport, CA, 1987.

Photo: Steve Gliessman

Level 2: Input substitution During the first few years of our farmer-researcher partnership, which began in 1986, we worked together in a comparative trial of strawberries going through the 3-year conversion process required for organic certification. Jim was growing strawberries using conventional inputs and management side by side with strawberries

Co-creation from the perspective of farmer Jim Cochran

"As a farmer, I will notice something in my fields and ask Steve about it. Many years ago I took over a ranch and it was half planted in artichokes and half planted in Brussels sprouts. I plowed the field, grew a cover crop and planted strawberries in the whole field. I noticed that the strawberry plants in the Brussels sprout half were doing much better than the plants in the artichoke half. I remembered having read something about crop rotations, so I asked Steve. People had stopped crop rotation more than 50 years ago when they began to apply chemicals, so it was sort of lost knowledge. Steve set up trials on my land and started looking at that particular crop rotation. He eventually found evidence that it was effective and that it wouldn't be necessary to use chemicals anymore. This is the ideal way for a collaboration to work.

One of the larger goals of our collaboration which I definitely supported, was to change the farming system. At that time there was no information available. If I went to the farm advisor asking about particular crop rotations, he was no help. He would say: "Jim you are crazy, the solution to that is to fumigate and it works like a charm". When I told him I don't want to do it that way he would say "well then, I am sorry, I can't offer you that much". So when Steve came, he really solidified my path, because I was sort of flying blind. I didn't write down my rotation schedule, I didn't write down my yield per block, I just sort of observed that stuff. He provided the scientific matrix in which to put the information that I was starting to collect."



An ideal strawberry agroecosystem, with rotations that include diversified crops and cover crops, with the entire system surrounded by nature. Swanton Berry Farm. Davenport, CA. Photo: Steve Gliessman



A view of the first strawberry conversion comparison, with side by side organic and conventional management plots, 1986-1989, at Swanton Berry Farm, Davenport, CA. Photo: Steve Gliessman

grown under organic management. In the organic plots, each conventional input or practice was substituted with an organic equivalent. For example, rather than control the two-spotted spider mite with a miticide, beneficial predator mites (*Phytoseiulus persimilis*) were released into the organic plots and this was monitored. By the end of the third year, ideal rates and release amounts for the predator—now the norm for the industry—had been worked out.

However, the agroecosystem was still basically a monoculture of strawberries, and problems with disease increased. The big question was whether the strawberry production system could be strengthened through diversification.

Level 3: Redesign It was at this point in the early 1990s that a whole-system approach began to come into play. Based on the concept that ecosystem stability comes about through the dynamic interaction of all the components of the system, we jointly conceived of ways to design resistance to the problems created by the monoculture system. Jim realised he needed to partially return to the traditional practice of crop rotations that had been used before the appearance of MeBr. Based on Steve's earlier allelopathy research, we redesigned the system with diversity and complexity that would help make the rotations more effective, and in some cases, shorter. We designed the crop rotations using crops in the mustard family in the rotations and as cover crops, so that their toxic natural products could be produced on the farm. It took more research to choose the right species and show the best impacts, and understand the ecology of interactions.

Rather than rely on externally sourced biopesticides, we incorporated natural control agents, keeping them present and active on a continuous basis. Perhaps the most novel redesign idea was the introduction of rows of alfalfa into the strawberry fields as trap crops for the western tarnished plant bug (*Lygus hesperus*). Some of these changes came from agroecological research, and others were based on 're-learning' some of the practices used for strawberry production before the 1960s.

Level 4: Alternative food networks Consumers have been a very important force in the transition towards sustainability. Jim began to sell organic strawberries at Farmers' Markets, where he could sell directly to consumers and capture a larger percentage of the sales price. Later he added to this other approaches that were even more direct, such as on-farm strawberry picking and a farm stand that includes the sale of processed products such as pies and jams. Later, students at the UC Santa Cruz convinced the campus dining service managers to integrate local, organic, and fair-trade items—including Jim's organic strawberries—into the meal service.

Level 5: Rebuilding the food system The knowledge partnership has brought about immense changes. However, several sustainability challenges are connected with this dramatic growth in strawberry production that can only be dealt with at the next level. For example, soil erosion and nutrient leaching have been observed in organic strawberries planted over a large area. Groundwater depletion and salt water intrusion into aquifers in strawberry growing regions is occurring. What might be called 'level-5 thinking' should include consideration of such issues, as part of a concern for the health of the entire system. And this must include more complex social issues such as labour and food justice. As early as in 1998, Jim has integrated social justice into his farming practices through a contract with the United Farm Workers (www.ufw.org), and 15 years later he also received AJP certification (www.agriculturaljusticeproject.org).

Continuously linking research, practice and social change

The results of our partnership extended far beyond Jim's farm. In the early days of our collaboration, we held farmer field days to showcase both our research findings and the farming practices. Jim's success became an incentive for other local growers to begin transitioning their farms, especially using substitution in order to gain organic certification. Over the years, our research results were published, we have participated in

The levels of transition to sustainable systems and the role of the three components of agroecology

Level	Scale	Role of agroecology's three aspects		
		Science	Practice	Movement
1 Increase efficiency of industrial practices	Farm	Primary	Important Lowers costs and lessens environmental impacts	Minor
2 Substitute alternative practices and inputs	Farm	Primary	Important Supports shift to alternative practices	Minor
3 Redesign whole agroecosystems	Farm, region	Primary Develops indicators of sustainability	Important Builds true sustainability at the farm scale	Important Builds enterprise viability and societal support
4 Re-establish connection between growers and eaters, develop alternative food networks	Local, regional, national	Supportive Interdisciplinary research provides evidence for need for change and viability of alternatives	Important Forms direct and supportive relationships	Primary Economies restructured; values and behaviors changed
5 Rebuild the global food system so that it is sustainable and equitable for all	Global	Supportive Trans-disciplinary research promotes the change process and monitors sustainability	Important Offers the practical basis for the paradigm shift	Primary World systems fundamentally transformed

Source: adapted from Gliessman 2015.

a variety of workshops, conferences, and short courses on organic strawberry production, and we used the farm as a place to continuously link research and practice.

In the two central coast counties of the US, where so many strawberries are grown, there were a total of 35,630 organic-certified acres in 2012, more than seven times the organic acreage recorded in 1997. The total farm gate revenue from organic farming in these counties was \$247.7 million in 2012, representing a dramatic increase of more than 2000 % from 1997. A parallel increase in organic strawberry production occurred over this same time period.

When Jim first decided to transition to organic farming, everyone told him that it was not possible to successfully grow commercial organic strawberries. And when we joined forces in 1986, we were considered to be too radical in our thinking if not actually crazy. But in fact, one of the most valuable parts of the collaboration has been having a friend with the same line of thinking. It really was a two way co-creation, with research results being presented to Jim, discussions back and forth about possible changes in the farming practices and systems, bringing in research ideas from other projects, sharing them and coming up with possible ways to put them to work on the farm, etc. We helped to keep each other going over 30 years of challenges. Through our partnership, we both evolved in our understanding and reasoning behind change processes toward sustainability.

Building this relationship took time, trust, flexibility, and a willingness to share knowledge, values, and belief systems. Such a participatory and action-oriented relationship is an essential component of the way agroecology must operate in order to promote either the scaling out to other farmers, or scaling up in the food system to promote real change. We have had to constantly be on the look out for co-option and concentration, by the large-scale vertically integrated and market oriented strawberry industry, or conventional agricultural research universities.

We have had many conversations over the years about how we have done agroecology together. We both are committed to maintaining and nurturing our strong belief in the need for whole food system change. We have learned together that agroecology is not just an academic activity. It is the broad integration of research, farming practice, and social change actions. Without all three, it is not really agroecology.

Steve Gliessman (gliess@ucsc.edu) was the founding director of the University of California, Santa Cruz, Agroecology Program, one of the first formal agroecology programs in the world. He was the Alfred and Ruth Heller Professor of Agroecology in the Department of Environmental Studies at UCSC until his retirement in 2012. **Jim Cochran** (jimcochran50@hotmail.com) is the owner of Swanton Berry Farm in Davenport, California, and the first commercial organic strawberry farmer in California.



Photo: FIPAH

A farmer- NGO-scientist synergy

Farmers are plant breeders when they select and save the seeds of the plants best adapted to the conditions in their fields. For over two decades, farmer breeders have been working with scientists and NGOs to develop new bean varieties. In a context of high agrobiodiversity, limited public sector agricultural research capacity and extension services, the process has not always been smooth. Against all odds, this collaborative effort, which has brought scientific knowledge together with farmer knowledge, has positioned farmers at the forefront of innovation for climate change adaptation. This article highlights lessons learned over 20 years about the power of knowledge co-creation.

Sally Humphries, Juan Carlos Rosas and Marvin Gomez

'Amilcar' is the name of a farmer and of a new variety of bean. The variety, which is praised for its excellent culinary properties, was identified by Amilcar's wife at an early stage of a bean trial and then improved by Amilcar with the support of researchers. Using genetic marker technology, Zamorano breeders subsequently identified a line of the Amilcar variety that is resistant to bean golden yellow mosaic virus. Disease-resistant Amilcar seed has become a regional commercial success. For Amilcar the farmer, the bean variety is a source of personal pride because it is highly appreciated by his community.

Participatory Plant Breeding The economic contraction in Honduras during the 1980s led to a decline in agricultural research and the disappearance of agricultural extension from public sector services. This left the private and not-for-profit sectors to deliver fee-based extension services. These were inaccessible to most family farmers cultivating the steep, marginal hillsides of north-central Honduras. It is these farmers who are most vulnerable to climate change-related food insecurity.

Honduran hillside farmers have selected their own seed for countless generations without knowledge of more formalised breeding methods. Farmers select for steady yields, but these also tend to be low. In 1993, the International Centre for Tropical Agriculture began to train local teams of farmers in research skills in 'Local Agricultural Research Committees' known as CIALs for their Spanish acronym (Comités de Investigación Agrícola Local). Shortly afterwards, two local NGOs, the Foundation for Participatory Research with Honduran Farmers (FIPAH) and the Program for Rural Reconstruction (PRR), started to support this initiative through their own programming. In 2000, in collaboration with the Pan-American Agricultural School (Zamorano), scientists at Zamorano and NGO agronomists began to specifically focus the CIAL research on participatory plant breeding. Since then, this research initiative has snowballed into a farmer-NGO-scientist synergy that has both made a place for itself in the regional seed market and become indispensable to the country's research network.

Innovative processes emerge

The CIAL research process begins with a participatory diagnosis and ranking of local agricultural problems, which CIAL members decide to address. Experiments take the form of controlled trials in which farmers compare different varieties on their farms. In participatory plant breeding, farmers collaborate with scientists at Zamorano, who may either cross a popular local bean variety with an improved one at farmers' request,

or scientists provide farmers with advanced lines of unreleased materials to choose from. CIAL members, trained in participatory research by NGOs, have learned formal selection techniques allowing them to conduct successive selections on their farms. In order

It is the synergy between farmers, NGOs, and scientists that provides added value to the breeding process

to ensure adaptation to local conditions, new varieties are screened first on a very small scale before selected varieties are tested on a larger scale and finally, successful varieties are propagated. To date, the partnership between Zamorano, NGOs, and CIALs has led to the development of 23 new bean varieties.

Institutionalised co-creation

Often, the participatory plant breeding process shows differences in the criteria used by farmers compared to those typically chosen by the scientific community. For farmers, taste and early maturation play an important role in the selection, whereas breeders generally seek to improve disease resistance, yield, and architecture. By engaging in joint research, farmers and scientists have succeeded in developing varieties that are more adapted to farmers' needs and conditions, increasing the adoption rate of new beans and reducing the time between research and dissemination of materials.

Farmer researchers evaluate beans for pests and diseases. Photo: Omar Gallardo





Farmers drive the research agenda in Vallecillos, Honduras. Photo: Omar Gallardo

This experience has shown that when farmers are put into the driver's seat and provided with the tools to conduct formal research, they successfully develop the varieties that most suit their needs. This is evidenced, for example, by the selection of drought-tolerant and shorter maturation varieties that do well in poor hillside soils and help farmers 'to escape the drought'. Additionally, those participating in the program use

Research support must be sustained over the long term in order to allow for trusting partnerships to evolve between the different players

agroecological management approaches, including making and integrating natural fertilisers and pesticides, as well as introducing greater crop diversity into their fields. As a result, they have managed to substantially reduce 'los juniros', the hungry period.

The CIALs benefit from the strong local demand for varieties generated through participatory plant breeding by the region's farmers, creating an economic incentive for participatory plant breeding research. Individual actions that lead to innovation, such as the selection of locally suitable varieties, are also motivated by collective values that come from being part of a CIAL and the prestige gained from sharing new varieties with family and friends.

Lessons learned Typically, agricultural research has characterised farmers as passive recipients of aid rather than mainstays of their own research

agendas. Conventional plant breeding is usually supply-driven: new varieties are released without knowing whether or not farmers like them. This mindset not only devalues local knowledge, but also increases existing differences in power relations between farmers and researchers. Participatory plant breeding on the other hand, is demand-driven. In Honduras, giving skilled farmer researchers an important role has not only benefited the formal scientific sector, but has also achieved a fundamental shift away from the top-down model of conventional breeding of the past.

As the Honduran experience shows, participatory plant breeding is not simply adaptive research where farmers fiddle with breeders' materials. In this context, it is the synergy between farmers, NGOs, and scientists that provides added value to the breeding process. The experience described here underlines the potential of farmer-centred approaches to support climate change adaptation and mitigation. The diversity of varieties created through participatory plant breeding puts them at the cutting edge of climate change adaptation. It also shows us that research support must be sustained over the long-term in order to allow for trusting partnerships to evolve between the different players. Moreover, to incentivise farmers' long-term engagement in participatory plant breeding research, seed regulatory systems must allow for the development of small seed enterprise.

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CIAL farmers supported by USC Canada hold selection trials for beans in La Esperanza.

Photo: Dana Stefov/USC Canada



Join the European food sovereignty movement !

Between the 26th and 30th of October in Cluj Napoca, Romania, the second Nyéléni Europe Forum for Food Sovereignty will be held. Drawing together between 700 – 1000 older and younger participants from 42 countries throughout wider Europe, it will serve as a celebration of the full spectrum of the food sovereignty movement comprising peasants and small farmers, fishers, pastoralists, shepherds, indigenous peoples, trade unions, consumers groups, NGOs, local authorities, researchers and many others.

The richness and diversity of the movement shows how increasing numbers of people, organisations and networks are coalescing around the shared language of food sovereignty and agroecology. It is also testament to the vast knowledge that is being co-created by these groups on how to organise food and agricultural systems that work both for people and the environment. It is crucial that those who care for, work on, live on the land and produce plentiful and healthy food are at the centre of that system.

In contrast to the assumption that knowledge trickles down from above, the global Nyéléni movement starts from the grassroots level. We look at how knowledge can be built from the bottom-up, through exchanges between people with different backgrounds and experiences, and can contribute towards shared strategies for building a more food sovereign Europe. The creativity and energy of young people is key in this process. Without shying away from the contradictions, tensions and challenges that such a project brings with it, the Nyéléni process acts as a safe and inclusive space for the exchange of good practices, skills and experiences.

These kinds of spaces are constantly under threat by those who wish to practice a narrow, elitist form



The first Nyéléni Europe Forum in 2011

Ludwig Rumetshofer (31) is a farmer and a member of ÖBV- Via Campesina Austria.

Sylvia Kay (29) is a researcher with the Transnational Institute in the Netherlands. They are part of the steering committee for the Nyéléni Europe Forum in October 2016.

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of knowledge creation. There are constant efforts to co-opt the core concepts of food sovereignty activists, such as the dangerous mingling between agroecology and climate smart agriculture or sustainable intensification. Under the mantra of 'resist, build and transform', the global Nyéléni movement thus seeks to put forward both defensive and proactive strategies for furthering food sovereignty based on horizontal knowledge sharing and creation. We believe that such a democratising approach to knowledge is essential to making the vision of food sovereignty a reality, in Europe and beyond. We warmly invite you to become a part of this exciting process.



Photo: Olga Yanira Juagibioy

“Agroecology is an epistemological revolution”

Victor M. Toledo is a Mexican ethnoecologist and social activist at the National Autonomous University of Mexico. His work focuses primarily on the study of agroecological and knowledge systems. In this interview, Victor M. Toledo explains why co-creation of knowledge is an integral part of agroecology and discusses the changes that are needed for this form of agriculture to gain ground in the global arena. He argues that agroecology is in itself a major shift in our relationship with knowledge.

Interview: Diana Quiroz

What is the role of knowledge in agroecology?

To answer this question, I would like to recall Alexander Wezel's definition of agroecology. Our French colleague defined it, first, as a science. This is obvious, since agroecology generates scientific knowledge in the strictest sense. However, agroecology, like many other hybrid disciplines (for example, political ecology, environmental history, and ecological economics) is an epistemological and methodological leap that generates new ways of doing science. That is, agroecology is already a new scientific paradigm. It is a politically and socially committed science.

Second, agroecology is also a practice. That is, it involves practical and technological innovation. But this is not technological innovation that arises in research centres, and then is passed on to farmers. No. Here, technological innovation results from both traditional peasant local knowledge and the knowledge of agroecologists, who are usually educated in the academic tradition.

Finally, agroecology is also a social movement. This is seen, for example, in the Latin American agroecology congresses, which are basically encounters between academia, producers, farmers' organisations, and social movements.

What is the role of the (agroecological) farmer in spaces for social innovation?

I would like to place my answer to this question in the context of the incipient global environmental, social, and economic crisis, and how some Latin American experiences are examples of possible solutions to this crisis.

First, there is the example of Cuba. After the collapse of the Soviet Union, Cuba, who exchanged sugar for oil, was suddenly confronted with a lack of both energy and a market for its most important agricultural product. The country went through very difficult times. Being forced into self-reliance, people organised themselves in neighbourhoods, city quarters, and cities, and found a way out of the food crisis through agroecology. The conversion to agroecology was so successful that the government had no alternative but to support it. Similarly, the most important farmer movements of Brazil (among them, the Landless Farmers' Movement) are successfully addressing a serious social crisis (land grabbing) also by adopting agroecology as their main paradigm.

Another example that illustrates the role of farmers comes from Mexico and Central America, where farmers use the 'campesino a campesino' (farmer to farmer) methodology. This methodology involves farmers sharing their knowledge to help each other use agroecological principles in local conditions. Also

in Mexico, coffee-producing indigenous communities carry millenary knowledge and, I dare say, are the pioneers of organic coffee production worldwide.

Because of the interest that this generated among agroecological scientists, Mexican agroecology is recognised to be firmly rooted in the traditions of indigenous Mesoamerican cultures. Their experience has been one of the catalysts of the agroecological movement in the country (see page 26-28).

What do agroecological scientists do to contribute to co-creation of knowledge?

Overall, one fundamental principle of agroecology is the recognition of the value of traditional agriculture. Through valuing and learning from ancestral wisdom, innovation emerges. In agroecology we act through what we call a 'dialogue of knowledges'. This has to do with the decolonisation of the mind. Agroecological scientists do not think they know it all (as is the case in orthodox science). They are not like conventional agronomists, who approach peasants with an attitude of supremacy and arrogance. Agroecologists do not teach farmers or producers how things are done. They engage in an intercultural dialogue that accepts that science is not the only way of looking at, transforming, and emancipating the world.

Wixarrica farmer blesses a recently harvested maize field in West-Central Mexico. Photo: Raúl Hernández Morales





Indigenous communities are at the forefront of agroecological coffee production.

Photo: Enrique Carrasco

In Latin America, for example, agroecological scientists are being influenced by what is called the ‘epistemology of the South’. This is a process of decolonisation from the cultural bias we have inherited from European thought. This is seen in the process of the decolonisation of the mind, where the region’s most

“Generating innovation through a ‘dialogue of knowledges’ has to do with the decolonisation of the mind”

critical thinkers question paradigms such as ‘progress’, ‘development’, and ‘competition’. These paradigms are precisely those that support the agroindustrial food production system.

Can you give us an example of an agroecological system created from this ‘dialogue of knowledges’?

Take the example of coffee, which is arguably the world’s most important agricultural product. Under conventional thinking, market demand drives the modernisation of coffee production systems, that is, growing it as a monoculture and at a large scale, using machinery, pesticides, and agrochemicals. Coffee produced agroecologically, on the other hand, is grown by small farmers. In Mexico particularly, indigenous communities grow non-conventional coffee under shade in highly diversified agroforestry systems. There, a cash crop was integrated in the traditional management of truly anthropogenic forests. In other

words, coffee, a relatively new product, was introduced into systems that already existed since pre-Hispanic times.

It is important to stress that agroecology does not try to avoid modernity; rather, it posits an alternative modernity. Not a modernity that destroys tradition, but a modernity that departs from tradition; modernity that respects traditional wisdoms and cultures and that seeks the encounter of knowledge and experiences. Nor can we afford the romantic thought of ‘all we have to do is rescue tradition’. Tradition also has its own failures and limitations. This example of agroecological coffee production is a beautiful case of how the combination of modernity and tradition can generate very advanced systems of food production.

What is needed for this ‘dialogue of knowledges’ to gain more recognition at universities and research institutes?

First, we must understand that when a dilemma involves two fundamental ways of producing food, a conflict will, of course, arise. In science, agroecology challenges a whole system of research and dissemination of knowledge, thereby generating a battle that takes place at universities and technology and research centres.

However, in my experience of the last twenty-five years, in Latin America there are increasingly more programmes where agroecology is either taught or researched. The force that drives this process is proof

Intercropping coffee and tomatoes.

Photo: Wikimedia Commons





Victor M. Toledo. Photo: Luis Ponciano

that this is not only an epistemological revolution, but also a cognitive and cultural one.

An example of this is that of the Andean region, particularly Bolivia, where an agroecology PhD programme was set up a few years ago by former graduates of the University of Cordoba's (Spain) PhD programme on agroecology and sustainable development. The majority of these new Bolivian graduates are either farmers of Aymara origin or the children of these farmers. This programme was not only the first one of its kind in Latin America, but it is one reputed for its high academic level. In the meantime, agroecology programmes have also started in Honduras, Colombia, and Mexico. I think that agroecology should become as widespread in the world as it has become in Latin America.

Moreover, I should also highlight another especially important counterforce (one which I belong to) that runs in parallel to the agroecological science-practice-movement: ethnoecology. By focusing on traditional knowledge, ethnoecology is expanding the paradigm of mainstream scientific knowledge to one that includes traditional knowledge. This is a force that increases at an impressive rate, especially among young researchers who promote the integration of different types of knowledge for the future of humanity.

What do you think is needed for this paradigm shift to occur at a global scale?

In the coming years we will be entering a period where we will need to define this new paradigm. This will imply that we need to discuss the role of science and research in terms of culture, ethics, and even politics. What we need is a science that responds to a world in crisis, a science that effectively addresses a very significant ecological and social emergency.

“Agroecologists engage in an intercultural dialogue that accepts that science is not the only way of looking at, transforming, and emancipating the world”

We are currently experiencing the breakdown of the great dogmas, of the great myths of modernity, and although we are moving towards replacing them in our discussions, much remains to be done in practice. We must be honest and recognise that although traditional knowledge has gained importance, conventional science still treats the producers of this knowledge as mere objects of study. Through the ‘dialogue of knowledges’, the researcher becomes involved in the defence of knowledge and starts to accept the need for a new scientific paradigm.

This brings me back to the first question in this interview. The role that knowledge plays in agroecology as a science-movement-practice provides an example of what a paradigm shift could look like. Moreover, the different agroecological experiences in Latin America provide examples of how to respond to this crisis. From this perspective, it can be said that agroecology is, in itself, an epistemological revolution.

To read more about agroecology in Latin America visit: <https://www.socla.co/publicaciones/> and LEISA Revista de agroecologia, www.leisa-al.org



Photo: Charanya, Food Sovereignty Alliance India

Climate change seen through indigenous worldviews

Adivasi communities have come together to collectively represent their cultural, agronomic and climatic calendar as they know it. Youth members have been using the life cycle to reflect on the effects of climate change and people's responses to it. This is a case of collective learning that reflects indigenous worldviews.

Sagari R Ramdas

Dialogue amongst the different members of The Food Sovereignty Alliance, India resulted in co-creating knowledge, strategies and actions to strengthen our food sovereignty and cope with climate change. The Food Sovereignty Alliance, India works to reclaim and democratise local community control over food and agriculture systems (see page 40-43). Members of our alliance include organised groups of Dalit people, Adivasis, small and marginal farmers, pastoralists, and co-producers. The co-producers are a political constituency of the alliance, who may not be directly

engaged with food production themselves, but work in solidarity with the Alliance. Co-creating knowledge is a key element in our movement through which innovative and creative solutions emerge. I share one such example through this article in which, through co-creation of knowledge, we developed our own way of assessing the impacts of climate change and strengthening our coping strategies in our villages.

Rejecting top-down solutions

The establishment of REDD/ REDD+ (Reducing Emissions from Deforestation and Forest Degradation programme), in 2010, as a key strategy to combat

CO-CREATION > LIFE CYCLES

climate change, has been applauded by world leaders. In practice, REDD entails sinking carbon in standing stocks of trees, and raising new plantations, often on indigenous territories. From previous such models of carbon trade that had been tested in their territories, indigenous peoples were aware of how such policies and programs alienated Adivasis from their territories and forests. They had been forced to relinquish customary practices and forest governance, undermining indigenous resilience and climate coping strategies and threatening local food sovereignty.

An indigenous alternative In 2010, Adivasi Aikya Vedika, a member of the Food Sovereignty Alliance, was invited by the Indigenous Peoples Biocultural Climate Change Assessment (IPCCA), to join a global initiative of indigenous peoples to assess climate change impacts and also to develop indigenous peoples' response strategies to extreme climatic events drawing from their knowledge, experience, wisdom and worldviews. The Adivasi community became deeply involved in identifying a framework of enquiry to facilitate local assessments of climatic impacts and response strategies. Intense dialogue amongst the different Adivasi communities and co-producers resulted in the idea of reconnecting with the indigenous rhythm of life or 'life cycle'. This life cycle is a representation of how the community members live their lives, based on the Adivasi worldview. It describes their relationship to their territories, seasons, food, forests, and the cultural cycles of life, in time and space.

In the course of one of the dialogues, at a meeting of Adivasi elders and youth, different groups were busy drawing their communities' life cycles on paper and we realised that this life cycle was in fact a lived, dynamic, indigenous epistemology that could be used by communities to assess and record the impacts of climate change in their indigenous territories and on their lives. There was tremendous excitement. Young people from the community took the lead in creating a collective vision of their communities' cycle of life. They began working with both male and female elders of the community recording their narratives and memories in spoken word, art, poetry, stories or songs. They translated all of this onto paper and on their walls. There was unanimous consensus of a circular representation of the life cycle.

In the case of some of the indigenous communities there existed another layer of information of 'how it was 70-80 years ago', in came from existing literature. For instance, books about Gonds the Chenchus and the Konda Reddis, include intricate descriptions of people's lives, centred around their relationship to their territories and seasonal cycles. This was used by the community as additional information about climatic events on the life cycle (see page 25).

The life cycle in action After illustrating the cycle as '*we know it is*', according to the communities' experience, the young folks of the community began to use the life cycle to assess in real time, the trends each year. This was done by recording what was happening in the present and comparing

Savara community mapping their territory and life cycle. Photo: Charanya, Food Sovereignty Alliance - India



They used the life cycle to identify forces that threaten or strengthen indigenous resilience

it with established life cycles. They compared the flowering and fruiting of trees, the appearance or not of birds and insects, the onset or delay of weather patterns, and sowing and harvesting cycles. They also used the life cycle to identify forces that threaten or strengthen indigenous resilience. Most significantly what emerged was that villages with strong functioning village councils were far more resilient than villages with poorly functioning village councils. For instance, village councils which had rejected plantations showed higher diversity of food crops and thus resilience to climatic changes, than villages where individual families were persuaded to replace food crops with plantations on their lands.

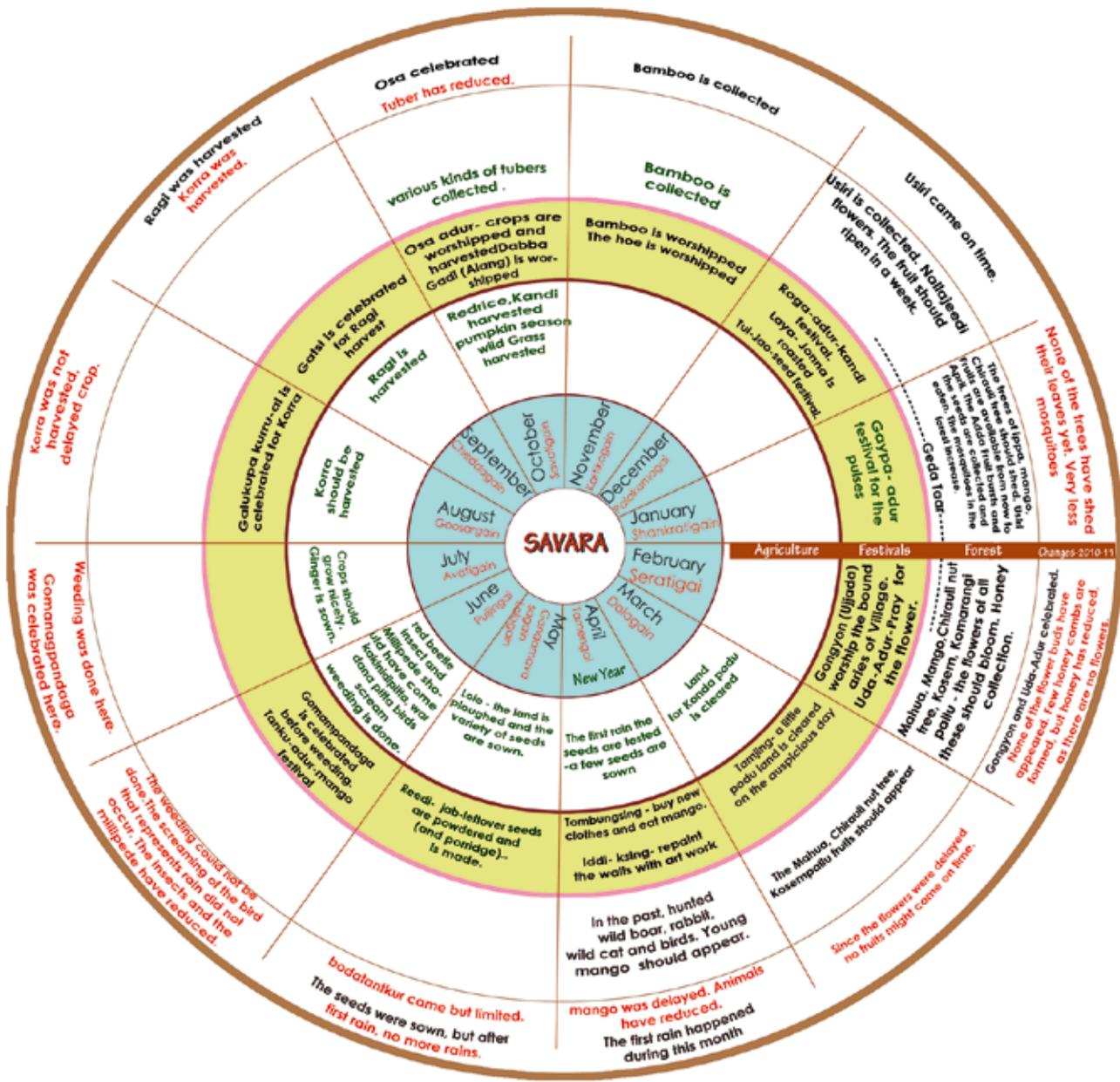
The life cycles illustrate the resilience of communities in the face of climatic variability. For instance, in 2012, the Savara community of Bondiguda village recorded how in the month of Lologain (approximately, the month of May), the usual season to sow diverse food crops, rains were scarce (see page 25). Around the same time, the community recorded how the forest department tried to convince, and in many in-

stances force, the community to raise tree plantations on their food crop lands, saying this would bring both money and rains. The constant refrain of the forest department is that growing trees will bring more rain. Discussions in the village revealed that despite the scarce rains and the pressures of the forest department, the village residents preferred not to establish tree plantations on agricultural land and instead continued to grow food. This continued planting ensured that there was food for the year, and seeds for the future. In this case, the life cycle exercise also made visible communities' commitment to autonomous food production despite external pressures to use the land for other purposes.

The life cycle approach not only continues to be used by the Adivasi communities to develop the idea, but it has also been adopted in other territories. It has proven to be an extremely effective approach for a number of reasons. It readily captured impacts of climate change, but this was just the first step of the process. The life cycles have been a critical tool for communities to discuss their own lives and situations. They have been a means for the communities to understand their own resilience and to share their innovative adaptation strategies with each other. They help communities to actively assert their knowledge and strategies in the wake of climate change, offering concrete proposals that build indigenous resilience as well as mitigate the effects of climate change. In other instances it also stimulated intense discussions on steps to be taken by the community to halt and prevent the entry of mining, dam and plantation projects.

Comparing the life cycle to experiences in the present. Photo: Food Sovereignty Alliance - India





Savara Adivasi Life cycle. Vykunta, Adivasi Aikya Vedika, India

The life cycle exercise also made visible communities' commitment to autonomous food production despite external pressures to use the land for other purposes

Road ahead A major challenge continues to be state and global policies that refuse to recognise these indigenous approaches and epistemologies as valid. States are still determined to push false carbon trade arrangements, such as REDD/REDD+ as the solution to climate change, despite evidence of another way forward based on Adivasi peoples worldviews and life practice. However, through the life cycles, communities are increasingly able to confidently reject the government's climate change proposals.

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Rescuing our maize: Building a network

A network of communities in West-Central Mexico has rescued its traditional landraces of maize. This experience shows that the benefits of defending an ancestral good is not only limited to regaining cultural identity and agrobiodiversity. The defence of native maize has become a space where old and new knowledge redefined agriculture and where people achieved food sovereignty, technical autonomy, and a new sense of community.

Jaime Morales Hernández

Throughout history, the ‘milpa’ has been the basis of Mesoamerican agriculture. The milpa is an agroecological practice where maize (*Zea mays*), edible gourds (*Cucurbita* spp), and beans (*Phaseolus* spp) are intercropped in association with woody, medicinal, and fodder plants, as well as fruit trees. Maize is more than a crop in Mexico, its centre of origin and diversification. It is the backbone of the

rural diet and culture; it lies at the heart of rural life. It is central to Mexican identity and a vital resource for all Mexicans.

Nowadays, however, Mexican agriculture is dominated by agroindustry and pursuing an agricultural model that has had serious social and environmental impacts in the country’s rural areas. Moreover, it has provoked the disappearance of milpa-based family farming – once the largest food producing sector of

the country and a major source of labour. Industrialised agriculture is also a serious threat to native maize diversity and Mexican cuisine, which was declared an intangible cultural heritage of humanity in 2012.

A collective dialogue In response to this situation, various movements emerged in defence of maize in rural and urban areas. The Network for Sustainable Agricultural Alternatives (RASA, in Spanish) is one of them. RASA is a cooperative which was created in 1999 in Jalisco state in West-Central Mexico. It consists of about 100 families of farmers, peasants, indigenous peoples, women, consumers, and advisors from twenty different municipalities. Striving for sustainable family farming, RASA bases its activities on three pillars: co-creation of knowledge, strengthening rural-urban linkages through fair trade, and conservation of agrobiodiversity through the milpa system.

The activities of RASA are based on the belief that knowledge created through dialogue between farmers and scientists must be the starting point for rural sustainability (see page 18-21). As a farmer explained: “We have been practicing agriculture since we were little children. Our knowledge allows us to approach traditional farming as a sustainable form of agriculture. Our relationship with the technicians and professionals in RASA is based on mutual respect and collective dialogue. Learning becomes the foundation that allows new knowledge to settle in. It yields insights that lead to innovative techniques and tools and that enhance our sustainability and autonomy.

Farmer-to-farmer In RASA, knowledge co-creation processes are based on the ‘farmer to farmer’ method, where a considerable number of farmers from the network are supported by others to act as trainers and advisors for other farmers. These activities are planned and organised collectively and they take various forms: experimentation, seed recovery, encounters, tours and workshops.

RASA trains its own group of advisors in *agroecological experimentation* to support producer groups. This training involves participatory assessments, design of experiments, field observations, evaluation of results and reporting skills. It takes place throughout key moments of the agricultural cycle and is strengthened during meetings, workshops and tours. Farmers who are trained serve as support for other farmers as ‘tutors’. Some scientists also assist in these experiments.

In its own sustainable agriculture training centre, RASA established a regional maize seed fund five years ago. The fund’s objective is to propagate and preserve the varieties that farmers perceive as threatened—currently including about 35 maize varieties. So

called ‘seed-keepers’, the farmers committed to taking care of these varieties, conduct experiments and carry out community planting projects with these varieties. They are also exhibited and exchanged at fairs and at regional meetings. Moreover, the seeds have also been the starting point for a *participatory plant breeding* programme. In this programme, seed-keepers, in dialogue with other farmers and advisors, recover old varieties, breed new varieties and experiment with different management practices. Furthermore, the seed-keepers are also responsible for sharing specific seed related knowledge with other farmers. The recovery and improvement of maize varieties, as well as seeds of other plants grown in the milpa systems, can therefore be seen as an important result of the co-creation of agroecological knowledge.

Farmers, advisors, technicians, and scientists also come together in regional-level ‘maize encounters’. These encounters evolve around the exchange farmer-bred maize seed and other seeds grown in the *milpa*, such as beans and squash. In doing so, the participants also exchange knowledge about cultivation techniques and various uses for the seeds.

During *tours*, network members visit sites outside of the state of Jalisco to learn from successful experiences in sustainable agriculture. These tours require the commitment of the network’s farmers and other communities to support each other mutually in their own development processes. Finally, RASA farmers organise *workshops* on agroecological techniques such as planting and experimentation in their own family

A RASA community workshop.

Photo: Patricia Karenina





Varieties of native maize. Photo: Patricia Karenina

plots and in their communities. These are dynamic educational and social events.

Growing through co-creation

In an adverse context marked by the advance of industrial agriculture, knowledge co-creation has accompanied every effort of the RASA network's members. These processes have allowed a move away from industrial agriculture, towards more sustainable milpa-based family farms. The results are impressive.

The network's family farms now grow an average of 8 species of fruit trees, 17 species of vegetables, 4 different types of grasses, 6 species of legumes, and 10 medicinal plants. They also tend to an average of five species of domesticated animals. This agrobiodiversity allows them to regain food sovereignty in the family, to withstand the rural crisis driven by agroindustry, and to achieve autonomy in their production systems. The families of the RASA network with more than 10 years of experience in agroecology are not only able to meet their food, education, and basic health care needs but their incomes are also 40% above the national average.

In all cases the starting point for evolution has been the collective sharing and development of the knowledge held in traditional farming practices such as the use of native seeds. Throughout this process, the vision of members of RASA was based on elements of peasant identity such as freedom, justice and dignity, and respect towards others and to nature. By fostering a caring attitude towards earth, nature and life, this identity shapes sustainable practice in a thoughtful way. As RASA members say: "Talking about seeds brings our people and our knowledges together". Ini-

tatives such as the effort of RASA to defend our native seed, guarantee spaces where knowledge about sustainable management practices can be co-created, and where we make our own decisions, strengthening farmers' autonomy and self-management.

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A 'maize encounter' in which farmers exchange seeds. Photo: Manuel Ayala Velazquez



The transition towards sustainable food systems has often been conceived on the basis of two sets of instruments: legal regulations that impose certain ways of acting and prohibit others, or economic incentives such as taxes and subsidies to reward good practices and discourage less good practices.

This classic view of transition operates on the basis of a conception of power that is top-down and centralised. In this view, power is something we take, grab, or fight for, instead of a much more decentralised concept that needs to be exercised across society. Also, this view on transition imposes uniform solutions across the board without taking into account local contexts, available local recourses, and the motivations that people have to act together. This way of conceiving the transition to sustainable food systems is now recognised as insufficient. We must think of another way.

A different understanding of transition starts from the bottom and from local solutions, rather than from the top and the centre of political power. Alternative food networks are burgeoning at the local level and are defining solutions for the future based on local knowledge. Another characteristic of new transitions is that the solutions do not come from technicians or experts or those who retain a monopoly of knowledge. The solutions come from ordinary women and men who invest time and energy in working out alternatives for their immediate environment.

Beginning from the local also allows building hybrid government systems in which politicians, economic actors and civil society organisations can join efforts in one single forum to rethink their food systems and invent new solutions. Now the challenge for public action is therefore to redefine its grammar in order to learn from these local-level, citizen-led initiatives.

The two views must be reconciled. Traditional top-down tools remain useful in certain contexts, but perhaps the state -and politicians more generally- should also understand that they need to learn, observe what is going on, be surprised by what these initiatives can teach them and, finally, they have to put public action at the service of citizen-led initiatives.

This is an excerpt from a speech that was delivered to the Voedsel Anders conference on fair and sustainable food systems, February 2016, Wageningen, the Netherlands, www.voedselanders.com. (See page 46)

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Learning from citizens

Olivier De Schutter

Two (or more) heads are better than one, goes the old saying, and the same is true in agroecology. As we see here, when people from diverse backgrounds come together, their different perspectives and experiences are fertile ground for creativity and innovation to blossom.

Mali

Crops and livestock: You can have them both

Farmers in Koutiala, a district in Southern Mali grow cereals to feed their families and keep cows for milk and as a form of savings. There, all the arable land is currently under cultivation. During the four months of the rainy season, farmers prioritise the cultivation of cereals over fodder production for livestock. A shortage of feed for the animals during the dry season leads to low milk production and high mortality of cattle. Farmers, in partnership with a local NGO and researchers from local and international research centres jointly determined the most promising pattern of



intercropping maize with cowpea, a crop with high fodder value. Together farmers and researchers experimented in small plots. With intercropping at the right moment in the rotation, farmers can feed their livestock without compromising food self-sufficiency of their household. By collecting extra manure in the stall, farmers could fertilise the cereals and the extra income from the milk could be re-invested in farm assets or goods for the family: “This is a key lesson that we will bring back to our families”.

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Belgium

Farmers give potatoes a new life

The Flemish farmer network – Biobedrijfsnetwerken (BBN) supports the development initiatives that bring farmers, advisors, and researchers together to tackle agricultural production challenges. For example, farmers from Greenflow, a cooperative of organic



farmers in Flanders, Belgium came together to find a way to meet the high standards of retailers. These farmers, with inspiration from advisors and researchers increased the shelf life of their potatoes. The potatoes are brushed instead of washed and therefore retain their flavour and take longer to perish. Moreover, the farmers designed and produced a paper bag that has a personalised label to inform consumers who produced their food and where it came from. Farmers have a lot of knowledge they can share, whilst other stakeholders, such as advisors and researchers, can provide complementary expertise to help the farmers innovate their management practices.

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France

Solving the challenges of social entrepreneur farmers

In 2015, Neo-Agri association and MakeSense started the AgriSenseTour in France to help farmers overcome their entrepreneurial challenges by working together with... gangsters! Ok, not real gangsters, but members of the MakeSense community who call themselves that way and who facilitate one-hour creativity workshops to help social entrepreneurs overcome obstacles. These workshops are called “Hold-Ups” (because the name fits nicely with the concept of being a gangster) and particularly target new peasants. There is no need to be an expert to take part in a Hold-Up, anyone can participate. Hold-Ups foster co-creation by and between farmers and citizens. They use creative techniques to help participants share ideas and sometimes even resources. From growing shiitake mushrooms on brewery waste to creating a system of organic waste collection and composting to sharing transport costs to access consumers, Hold-Ups have helped farmers design innovative agroecological techniques. Moreover,



anyone can learn to prepare and facilitate a Hold-Up thanks to an online open source library of tools which can be accessed upon (free) registration as a MakeSense community member.

Contact Sidney Ortun Flament and Bruno Macias (contact@neo-agri.org), www.neo-agri.org

Indonesia

Responding to climate change locally

An anthropologist, an agrometeorologist and Universitas Indonesia students and other scientific and administrative support staff have teamed up with rice farmers in Indramayu (Java) and on Lombok, to face changing local climatic patterns. The aim is to generate reliable climate services on which farmers can base their crop management decisions. This is done through co-production of knowledge that is rooted in scientific and local expertise and takes place in mutually supportive undertakings. They consist of conducting field experiments, rainfall measurements and agroecological observations (soil, plants, water, biomass, pests) on a daily basis. With these data that farmers collect, farming strategies are jointly developed and discussed monthly in Science Field Shops. Including monthly climate predictions, farmers and scientists learn about agrometeorological consequences of climate change locally. Training of Trainers allows upscaling of the Science Field Shops.



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Photo: Marc Schut

Institutionalising dialogue in **Rwanda** through innovation platforms

A platform of farmers, retailers and service providers, civil society organisations, NGOs, government officials, and researchers improves livelihoods in Rwanda. Through interaction and collaboration, these groups experiment with various technological and institutional innovations, thereby tackling local agricultural challenges. This experience illustrates the importance of institutionalising a space where knowledge can be co-created.

Marc Schut on behalf of the CIALCA / Humidtropics East and Central Africa Team*

The high altitude hills and cooler temperatures of the Great Lakes Region of Central Africa provide the ideal conditions for agriculture. However, population pressure and years of civil conflict have caused soil exhaustion and limited the availability of spare land, as well as paralysed agricultural advisory and extension services, resulting in poor access to markets. Not surprisingly, farm households in parts of this region rank among the most food insecure and malnourished in the world. Although there is great uncertainty about the type of solutions that will effectively solve these problems, it is clear that developing, testing, and implementing these solutions require collaboration between several groups of stakeholders.

Collective action To facilitate this collaboration, ‘multi-stakeholder innovation platforms’ (IPs) started in 2013 in Rwanda as part of a larger research-for-development programme called Humidtropics. An IP is a space for learning and change. It is a group of individuals with different backgrounds and interests. The objective of these IPs is to facilitate knowledge co-creation through joint problem analysis, priority setting, testing of innovations, and learning.

To start off, (inter)national agricultural research organisations, together with the government and development partners, identified sites in the Great Lakes Region with agricultural potential to improve livelihoods and market opportunities, and to reduce land degradation. In Rwanda, for example, a small team of Humidtropics and government researchers together

with a representative of the national peasant organisation decided to focus on Kadahenda, in the north of the country. There, they teamed up with local authorities and different farmer groups. They identified opportunities to boost agricultural production in the region, and decided that improving the quality of and access to potato (*Solanum tuberosum*) seed would be a good starting point.

A journey starts In February 2014, a group of Kadahendan farmers, representatives from government and the private sector, as well as researchers and NGOs came together to take this further. After discussing concrete research and development activities, such as testing different potato varieties, intercropping, and pest and disease control, the first community IP was launched.

The members of this IP were involved in the selection of the varieties and designing the activities. Volunteer farmers conducted trials on their land, while government and research organisations provided inputs such as seeds and management advice. To support the community level IPs, a national level IP was established to provide science advice and services. Despite the initial enthusiasm, however, the young IP did not manage to get any potato seed into the ground because the involved organisations did not manage to mobilise resources to do so.

Solving problems, growing confidence To address this problem, Humidtropics provided 'platform-led innovation funds'. What was special about these funds was that the members of the IP could decide how to spend them. From that moment on, the intensity of activities in Kadahenda increased. Community IP members started meeting whenever they felt there were problems that required a group discussion. Slowly but surely, IP members in Kadahenda gained faith in the platform, and farmers helped one another planting and harvesting, and shared problems and their potential solutions with the whole group. Additionally, experienced farmers assisted new members to become familiar with the IP and its activities.

Members of the national level Innovation Platform in Rwanda and Humidtropics management visiting the potato fields of the Kadahenda Innovation Platform. Photo: Alain Hero Ngamije



Despite the growing confidence, challenges kept emerging. This demanded even more collaboration and problem solving by IP members. One of these challenges related to the farmer's lack of access to manure. To address this problem, farmers decided to set up a system among themselves in which each farmer IP member paid 1.3 USD monthly. With this money, the group bought a sheep that was given to one of the members. Each month, another member received a sheep and, once the sheep reproduced, the lamb was given to another IP farmer.

In order to evaluate the collaboration process, community and national IP reflection meetings were organised at the end of each season. During these meetings, specific research or development activities were abandoned or adopted, depending on the reflections and the changing priorities of the IP members.

Looking back Almost three years after their inception, some lessons have been learned regarding the performance and impact of IPs for knowledge co-creation. Putting resources in the hands of stakeholders enabled them to steer the research and development agenda, and to implement activities that no other projects or businesses were able to support. Having IPs at the local and national levels can bridge different innovation processes. Addressing community-level barriers (e.g. access to land, inputs, credit, and markets) often requires change at higher policy levels. The regular IP reflection meetings stimulated short-loop learning and timely adaptation of research and development activities to support collective action. The experience here shows that community level IPs can provide the space necessary for different types of knowledge, experiences, skills, resources, and attitudes to come together and co-create innovation. However, collaboration between different groups of stakeholders across different levels is also difficult. People have different interests, needs and objectives that sometimes clash. We are continuously learning about what works and what does not work as we move along.

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Photo: Evelien de Olde

Inspired by peers: Farm Talks in biodynamic agriculture

In the Netherlands, a peer review method for farmers arose as an alternative to the biodynamic certification system. By collectively observing and discussing site-specific challenges, these biodynamic farmers experience first-hand the power of collaboration and drive commitment to sustainability beyond the standards of biodynamic certification.

Evelien de Olde and Petra Derkzen

As we pass the rows of lettuce, cabbage and leek, the farmer whose biodynamic farm we are visiting tells us about the birds he has spotted lately, the newly-built nature trail, and the pond where a rare lily last seen 15 years ago has reappeared. The other biodynamic farmers participating in the Farm Talk, two large-scale vegetable producers who each farm more than a hundred hectares, and a dairy farmer, listen, observe and ask questions. Our host shows us the triangular area between the pond, the hedge and the field, long-infested with stinging nettle, which he finally turned into a hay meadow. Later, as we sit at the kitchen table in the farmer's house

reviewing all of the biodynamic aspects of the farm, the visiting farmers suggest the possibility of adding more animals to the farm system in order to close the nutrient cycle. The farmer already keeps bees for honey, and the new hay meadow is only big enough for two cows or heifers. Other options are weighed. Eventually, the host farmer and his wife decide to explore the possibilities for integrating animal husbandry into their farming activities in the coming year.

Initially known as the 'Mansveltscore' (after one of the co-founders of this method, Jan Diek van Mansvelt), Farm Talks were developed in 2008 by the biodynamic farming association and the Demeter certification organization in the Netherlands as a potential

alternative to the certification system. The method was regularly evaluated and adjusted but it was decided in 2013 that the outcomes of the Farm Talks were not suitable for inclusion in the accreditation for Demeter certification. Nonetheless, the Farm Talks continue as a practice that provides a space for farmers to evaluate and learn from each other's experiences to support the development of their own farms, and of biodynamic farming in the Netherlands. Approximately 130 Dutch farmers currently participate in the Farm Talks.

Exploring opportunities In each Farm Talk a group of four to five peers representing different agricultural sectors visit the farmer whose farm is evaluated. During the biannual visits, a coach from the biodynamic farming association facilitates the process. The host farmer discusses the strengths and challenges faced on the farm, and together with her peers, examine possibilities for development. Through discussion, participants explore the meaning of biodynamic farming and sustainability. This contributes to a collective and context-specific understanding of these concepts.

During the review, the farm is characterised and evaluated against predetermined biodynamic principles. In anticipation of a Farm Talk, the host farmer prepares the visit by revising a set of questions to evaluate her own farm based on eight different, yet related themes (see the figure on page 36). Additionally, each host defines possible development actions for the farm. Although the structure of each Farm Talk varies, four phases are observable.

Collective, yet context-specific understanding First, during a short tour, the host shows the farm focusing on the parts that either represent a challenge for the farmer or that are unique and pleasant. Next comes a crucial feature of Farm Talks: 'characterising'. The aim of characterising is to capture the *essence* of both the farm and the farmer as they are on the day of the visit. This is done after the tour, before the farm is systematically discussed. Sitting at the table, all farmers and coaches take a moment in silence to visualise an image, word, or picture that represents the essence of the farm and farmer. This vision should represent their feelings and perceptions beyond the explicit questions and answers that have been previously exchanged.

Care farming is a popular practice in Western Europe that involves the use of farming practices for therapeutic purposes. Recently, during a farm visit at a care farm, images such as a 'Rubik's cube' or a 'wizard juggling many plates in the air' and an 'octopus' came to the minds of the farmer peers. These images reflected the farm's complex organization. Everyone was impressed with the host farmer's ability to organize the

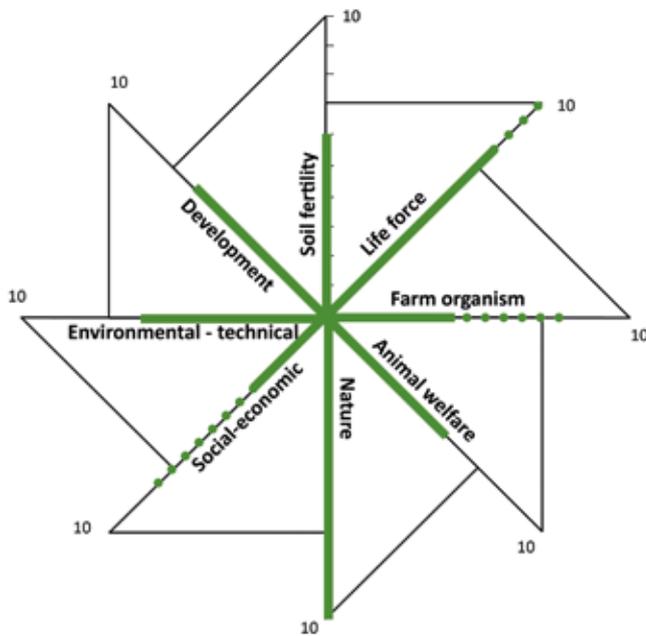
farm's various tasks around people with special needs and capacities, and to deliver orders timely while dealing both with several care institutions and inclement weather, all the same time. Although these images vary greatly among participants, they often seem to convey a similar message. Moreover, the exercise makes room for creativity and imagination to be expressed and paves the road for a deeper discussion about the farm.

After 'characterising' the farm, participants rate its performance on the same eight themes the farmer had used to evaluate her own farm before the visit (see figure on page 36). In the peer review phase, the host farmer discusses her own appraisal and compares her ratings to the scores given by her peers. Differences in the evaluations often form the basis for new insights. From the discussion, issues that could be developed or that required attention are noted. Then, the host selects the aspects she would like to work on, develop, improve, find out or learn. She formulates a specific action plan to reflect these goals that begins with 'I want...'.

This special constellation of backgrounds helps to develop innovative ideas and insights

Farm Talks host Sander Koster, at his farm.
Photo: Frederieke Bosch





Farm Talk participants rate the farm's performance according to different themes.

Drawing: Evelien de Olde

An atmosphere of trust In the Farm Talks, groups consist of farmers from different sectors. This special constellation of backgrounds helps to develop innovative ideas and insights, as well as to prevent discussions that are too specialised from taking place. The role of the coaches is important to give structure to the meeting and to create a safe and positive atmosphere where challenges can be shared openly. The coach can facilitate the process by interfering when discussions become too technical, by shifting in focus to another farmer, or by introducing aspects not yet discussed.

A Farm Talk requires a frank reflection of the aspects that work well on the farm and those that can be improved, as well as an atmosphere of trust and openmindedness. This is cultivated through transparently communicating the expectations of the talk, an

appreciative inquiry and a collaborative and positive attitude. An atmosphere of trust allows colleagues to ask questions and support the farmer through exploring their basic motivations, assumptions, and values together with them, as well as helping them to establish specific development actions.

Evolving together The experiences here emphasise the importance of an honest reflection and critical discussion of on-farm challenges. Transparency and good facilitation within an atmosphere of trust add to an integrative farm characterisation and actions for future development. Discussing the meaning of biodynamic farming within the context of a specific farm supports the co-creation, understanding, and dissemination of the concept. This is seen in the example at the beginning of this article. After the farm tour, the group of farmers discussed the biodynamic principle of integrating livestock into the system to close the nutrient cycle. The participating farmers gained something. For the farming couple, this meant the opportunity to explore different options for integrating more animals onto their farm. All other farmers were reminded of the importance of ruminants in biodynamic farming for improving soil fertility. Farm Talks not only enable farmers to inspire one another, but they also help to deepen farmers' own understanding of sustainability, which benefits society at large.

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Max van Tilburg guides a Farm Talk tour on his farm. Photo: Frederieke Bosch



Biodynamic farmers discuss challenges on the farm of Piet van IJendoorn. Photo: Evelien de Olde



Co-creating the agricultural biodiversity that feeds us

The co-creation of knowledge about agricultural biodiversity is an essential part of peasant strategies for survival and autonomy. Facing the threats of the industrial model of production and consumption, peasants and social movements are defending agroecology and their dynamic management of agricultural biodiversity. Together with others, they are building collective knowledge about developing localised, biodiverse food systems, about reclaiming access to their territories and about engaging in research and policy making as principal actors.

Our food is based on a great diversity of plants, animals, fish and micro-organisms. This diversity has been developed through collective knowledge, co-created between food producers and nature. It is the basis of all agroecological production systems. Through working with nature, peasants, including hunter-gatherers, artisanal fishers, livestock keepers, and other food providers learned about and innovated with ways to enhance and sustain agricultural biodiversity. The first to do so were women who innovated by collecting, sowing and selecting seeds. Food producers shared knowledge, together with their seeds and breeds, with peasants in other territories across countries and continents where, in turn, the co-creation of knowledge greatly expanded agricultural biodiversity suited to diverse ecologies, environments and human needs. The result is many hundreds of thousands of different plant varieties and thousands of livestock breeds and aquatic species which have

been selected or adapted to serve specific requirements.

Common to the worldviews of many peasant food providers is the belief that all of nature is living and that human beings are part of the family of living creatures and the environment, not outside of it. These worldviews have deep implications for how peasants and other small scale food providers create knowledge. Nature shapes the possibilities of life for human societies. Culture, beliefs and our values, in turn, shape how we take care – or do not take care – of nature. Awareness of the links between nature and culture are explicit in many societies. And in many others, where that awareness has been lost, people are organising and taking action to reclaim this awareness. Humans and other living beings have been engaged in an ancient relationship of mutual interaction shaping each other's existence in a process of co-evolution.

This process of co-evolution has created agricultural biodiversity and the agroecological systems it supports. Its dynamic management is an essential part of long-

term peasant strategies for survival and autonomy. Agricultural biodiversity is the manifestation of the creativity and knowledge of peasants as they engage with the natural environment to satisfy their needs. It embodies a dynamic and constantly changing patchwork of relations between people, plants, animals, other organisms and nature, continuously responding to new challenges and finding new solutions.

Threats and responses Agricultural biodiversity, and the creativity and collective knowledge on which it is based, is threatened by the industrial model of production and consumption. In response, peasant societies and social movements are organising locally, regionally and internationally to defend agroecology and regenerate their dynamic management of agricultural biodiversity in the framework of food sovereignty. Together with other relevant actors, for example NGOs and like-minded scientists, they are improving collective knowledge about how to respond.

This results in very diverse, multilayered strategies. Peasants are developing their interlinked and localised models of production and consumption and, especially women, are providing biodiverse foods for autonomous food systems and local food webs served by local, and sometimes cross-border, markets.

Peasants are fighting to reclaim access to their territories, migratory routes and fishing grounds. Securing their control over their territories allows them to regenerate agricultural biodiversity, above and below ground and in waters, through, for example, agroecology, agroforestry, artisanal fisheries, community management of mangroves, and mobile pastoralism. In Colombia, for example, peasants are proposing to regain control over their territory and renew a relationship with nature that does not lead to its destruction, as at present. They want food production based on the traditional knowledge of respect for the natural environment, using agroecology. In Palestine, restrictions of access to coastal waters are severely affecting the diverse and the food security of Palestinians in the Gaza Strip.

Peasants are asserting their inalienable rights for collective control over seeds and biodiversity. They are developing *Maisons des Sémences*, supporting peasant seed networks, seed fairs and maintaining diverse breeds of livestock and diverse fisheries. Even in regions degraded by industrial systems, local food providers are re-learning the importance of biodiversity. For example, French bakers cum seed breeders are regenerating varieties of wheat suited to the local environment and artisanal baking, meeting local demands for high-quality breads.

Peasants are producing, and often processing, local foods, feed, fuel and fibre for markets that support bio-



Gaza fishers protest the blockade of their fishery.

Photo: Kevin Neish

diversity. Community supported agriculture based on agroecology, and associated processing, can sustain biodiverse production by selling a wide range of varieties of cultivated and wild plants, breeds of livestock and fish species. For example Andean breeds of alpaca, which produce a diversity of 11 colours of alpaca fibre and are well adapted to the harsh environment, require a supportive market to fend off the lucrative but biodiversity-blind market which demands uniform white alpaca fibre that is subsequently dyed artificially.

Peasants are engaging in research that increases agricultural biodiversity of plants, livestock and aquatic organisms. Their research respects collective rights and encourages the co-creation of diverse knowledges. For example in Iran, evolutionary plant breeding, which is a strategy for rapidly increasing on-farm biodiversity, farmers cultivate very diverse mixtures of hundreds or even a thousand or more of different varieties and allow these to evolve and adapt to their local conditions. These evolutionary populations are living gene banks in their own fields from which seeds from the most adapted varieties and mixtures are used for sowing crops.

Autonomous and self-organised participation in policy formation

Peasants are now included in policy formation. Democratic decision making processes including peasants have now been realised as a result of pressure from peasant organisations. In the UN Committee for World Food Security (CFS), for example, peasants can

Farmer examining a field of an evolutionary population of wheat in Sahneh, Kermanshah, Iran.

Photo: CENESTA



now debate issues with the same rights to express their views as other actors, including governments. A critical issue under discussion is the oversight of the governance of agricultural biodiversity and agroecology, in terms of their contributions to food security. This is a priority of peasant organisations for the agenda of the CFS. Peasants' representatives are urging similar forms of engagement in the International Seed Treaty (ITPGRFA) and the Commission on Genetic Resources for Food and Agriculture so they can more effectively champion the policies needed to sustain agricultural biodiversity and realise Farmers' Rights, and challenge policies that serve monopoly interests in the food system.

Peasant knowledge is key, but it must be in dialogue with other knowledges. Yet, recognition by many international and national institutions of the importance of peasant knowledge rarely means giving priority to it. In reality, where multiple knowledge systems are concerned, the supremacy of positivist (modern) science is tacitly assumed by those serving monopoly power. Attempts to incorporate indigenous or peasant knowl-

edge and public or citizen science often include only those aspects that are consistent with positivist science.

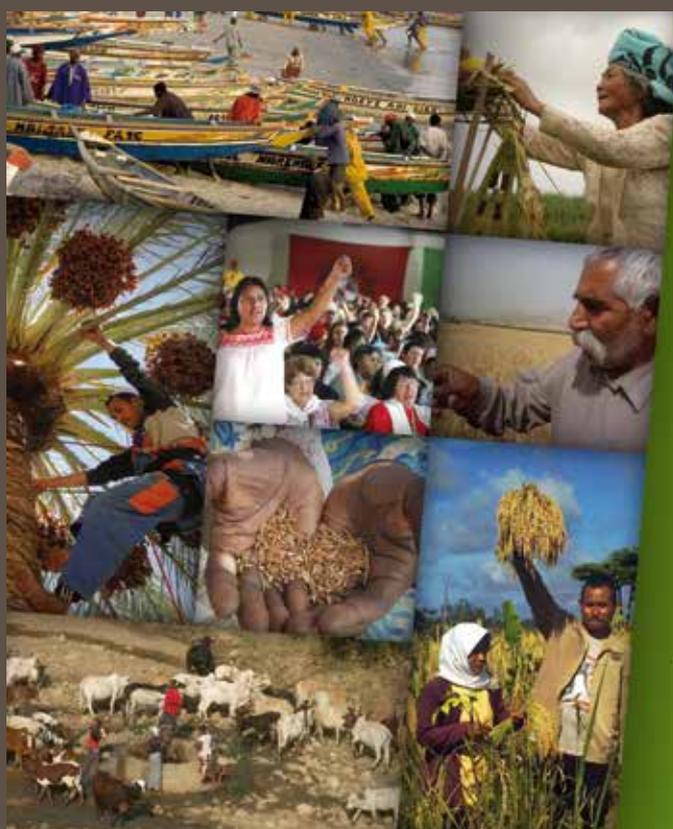
Given the substantial economic and political investment in research that undermines the development of knowledge in support of agricultural biodiversity, an urgent issue is to give precedence to the co-creation of knowledge, by peasant producers and other like-minded actors, which will challenge the dominance of positivist science. It is crucial to identify how, together, we can develop the knowledge needed to reclaim research for the public good; to realise changes in governance that will ensure the implementation of research that is directed towards enhancing a wide range of agricultural biodiversity, sustained ecologically in the framework of food sovereignty. This, perhaps, is one of the greatest challenges for the co-creation of knowledge.

This article is based on a report prepared for the Working Group on Agricultural Biodiversity of the International Planning Committee for Food Sovereignty (IPC Rome Secretariat - m.conti@croceviaterra.it).

Peasants give life to biodiversity

This 16 page brochure is based on a report prepared for the Agricultural Biodiversity Working Group of the IPC for Food Sovereignty and (enclosed with this magazine). The report titled "Biodiversity for Food and Agriculture: the perspectives of small-scale food providers", is a Thematic Study for FAO's

report on the "State of the World's Biodiversity for Food and Agriculture." The brochure, in Arabic, English, French, Portuguese and Spanish, and the fully referenced paper in English, are available. www.foodsovereignty.org/biodiversity



**PEASANTS
GIVE LIFE TO
BIODIVERSITY**

We have shaped biodiversity for food and agriculture and it shapes us; food sovereignty and a healthy environment depends on it.

"Food sovereignty ensures that the rights to use and manage lands, territories, waters, seeds, livestock, and biodiversity are in the hands of those of us who produce food."

Declaration of Nyeleni, 2007.

Strengthening people's knowledge

Photo: Food Sovereignty Alliance - India

For the past half century agricultural innovation has denied a voice to the many groups who work outside the profession of science – farmers, food providers, women and the urban poor. The value of their expertise gained through practical experience must be recognised in the production and validation of knowledge.

Tom Wakeford, Colin Anderson, Charanya R.,
and Michel Pimbert

Padma, who has travelled 300 miles from her village in the Eastern Ghats, joins a group of the Gond indigenous people of central India next to a small government-built reservoir at the edge of their ancestral forest. Her hosts have built a large structure from materials usually used for weddings. This is to be the venue of interactions between Adivasis (India's indigenous people) small farmers, pastoralists and Dalits. They have come together with those who do not farm, but who are concerned about food sovereignty.

In the past era of scientism, the insights of farmers like Padma were excluded from processes where knowledge was validated and policies were formulated. The 2015 gathering in which she is participating is one of the spaces being claimed by many such communities. Eating, meeting and sleeping in the same makeshift tents, food producers enter into dialogue with others involved in the food system as part of a growing social movement - India's Food Sovereignty Alliance (see also pages 22-25). They share stories and critically reflect with scientists, local government officials and other policy makers.

During the meeting they discuss government poli-

cies relating to seeds, water and land in relation to the threats these may bring to their livelihoods. The event builds on twenty years of knowledge sharing and movement building by a network whose origins are firmly rooted in the teachings of Paulo Freire and the many Indian pioneers of democratic practice and critical thinking in communities. The lack of financial support for such efforts from large NGOs does not hold the movement back. On the contrary, organising accountable structures from the bottom-up, alongside horizontal working practices, strengthens the movement's resilience.

Mainstream agricultural development has been largely based on scientism – a worldview based on imposition of a logic based on nineteenth century physics that ignores or displaces local and indigenous knowledge systems. Policies based on scientism generally promote top-down technologies and development that is indifferent to local priorities or involvement. The imposition of green revolution technology in the global South has often been argued to increase productivity, but it has done little to decrease hunger. It has had dire consequences for the environment, food and nutritional security and the resilience of people like Padma.

Science has an important role to play in agricultural development. However, the marginalisation of local knowledge and priorities, combined with the overwhelming focus of science on improving yield, has pushed agroecosystems and rural livelihoods to breaking point. The Food Sovereignty Alliance is not alone in arguing that research that focuses on technological fixes without addressing the politics of knowledge and the democratic deficit in the governance of food systems and society is incapable of addressing the

Research that focuses on technological fixes without addressing the politics of knowledge and the democratic deficit in the governance of food systems and society is incapable of addressing the world's multi-faceted food crises



Performing a play as a stimulus for discussions at the Food Sovereignty Summit, Telangana, India, 2015. Photo: Food Sovereignty Alliance - India

world's multi-faceted food crises.

A broad shift to agroecology requires a deepening of democracy that breaks the knowledge monopoly held by professional scientists and powerful institutions, particularly policy-makers. It also requires political and cultural transformation that empowers food producers and citizens in the governance of public agricultural research. It must support the autonomous knowledge production processes carried out by citizens, local communities and social movement organisations such as India's Food Sovereignty Alliance and international platforms such as La Via Campesina.

Networks and collaboration

From this perspective, innovation and development based on agroecology emerges from creative processes of knowledge co-production and mobilisation carried out by diverse collectives of farmers, citizens and scientists. Around the world, these processes are gathering momentum through farmer-to-farmer networks, participatory action research and other equitable collaborations between food providers, researchers and activists.

A series of farmers' juries, initiated by the Deccan Development Society's Prajateerpu in 2001, have successfully challenged the displacement of people by mechanised agriculture in India. During the last two years, both the Food Sovereignty Alliance and older groups, such as the Karnataka Rajya Raitha Sangha (KRRS), have combined an agroecological, evidence-based approach with strong grassroots campaigning. This has undermined the top-down narratives of genetically modified crops, land consolidation and mechanisation being the route to better livelihoods and health. It has allowed traditionally trained scientists to enter into dialogue with these social movements and is opening new opportunities for social movements to influence agricultural development in India.

Agroecology has been rightly called a practice, a

A broad shift to agroecology requires a deepening of democracy that breaks the knowledge monopoly held by professional scientists and powerful institutions

science and a social movement. Equal attention to each pillar of this knowledge triangle – practical, scientific and political knowledge – is key to unlocking the potential of agroecology. Yet, practical, local knowledge is undervalued by mainstream research and development institutions. Questions about whose knowledge ‘counts’ as being more or less valid, and why this matters, are generally left unasked.

Rejecting scientism

Although some mainstream institutions and scientists are starting to pay attention to agroecology, their narrow framing of agroecology as a science and the intentional ignoring of the deeply political and social nature of agroecology and agroecological knowledge systems is another example of the bias that is inherent in scientism.

For example, participatory technology development (PTD) has traditionally emphasised technical innova-

tions as the solution to sustainable agriculture, obscuring the political, institutional and cultural contexts. Using such a framework means that farmers like Padma are given passive parts in development schemes. Their presence in so-called participatory processes are merely a means of policy makers gaining legitimacy for decisions that they have already made. This democratic deceit allows the structural violence perpetrated by neocolonialist, neoliberal and institutionally racist policies to go unchallenged.

The danger of a narrow understanding of agroecology as scientism was made clear when the FAO organised a technical symposium in Rome on agroecology in September 2014. Encouragingly, this was the first major FAO meeting to focus on agroecology, and has since been followed up with regional level consultations in Asia, South America and Africa. However, at the Rome meeting, scientists dominated the agenda and civil society representatives were only marginally represented. The organisers restricted the meeting to so-called technical discussions, attempting to censor debates about politics. Presenters were discouraged from discussing political topics related to biotechnology, seeds and especially food sovereignty.

This decoupling of the political from the practical and the technical puts agroecology at risk of being co-opted by mainstream institutions. Social movements are rejecting this type of development as false agroecology with its overemphasis on elite scientific knowledge. Formally trained scientists have a role, but equally important are the local knowledge, practice and the experience that citizens (whether producers or co-producers) have gained through their lives on the farm or even at the market, shopping for dinner and cooking.

International Forum for Agroecology, Nyéléni Centre, Mali, 2015. Photo: Colin Anderson



Social movements as sites of knowledge mobilisation

The political dimension of agroecology requires that its practitioners and advocates move beyond conceptions of the co-production of knowledge to take up the mobilisation of existing and newly co-produced knowledge as a part of political struggles to transform the food system.

Social movements are bringing citizens together to articulate the knowledge that forms the foundation of agroecology, enabling collective analysis of the problems that need to be addressed and providing a common platform that can help raise awareness and mobilise people for political change.

One example is the International Forum for Agroecology in Mali in February 2015 organised by the International Planning Committee for Food Sovereignty and La Via Campesina. At this forum, food providers from around the world collectively articulated a declaration that had been drawn up through a bottom-up process. The statement defines agroecology from



International Forum for Agroecology, Nyéléni Centre, Mali, 2015. Photo: Colin Anderson

Practitioners and advocates must take up the mobilisation of existing and newly co-produced knowledge as a part of political struggles to transform the food system

the perspective of a range of more-or-less democratically organised social movements. This declaration should be a key reference point for all agroecological projects that claim to be politically progressive.

These efforts at participatory democracy are inevitably flawed and we are finding that there is much to learn from other struggles for social justice, such as the US civil rights movement, anti-colonial movements in the global South and the international networks of people living with HIV/AIDS. However, the Mali statement marks another important step towards more democratic processes of co-production and mobilisation of knowledge amongst social movements.

Experiential learning

There is an urgent need for public investment in agroecological research – however it is essential that the governance of public research be democratically controlled in the interests of food providers and the public. The democratisation of agroecology research needs to occur throughout the research and develop-

ment cycle. Non-elites who bring expertise from their life experience, must be part of redesigning scientific and technological research, evaluations of results and impacts of research, the choice of upstream strategic priorities, and the framing of overarching policies.

In the past, narrow concepts of participatory research confined non-researchers to ‘end of the pipe’ technology development (e.g. participatory plant breeding). We now need to move to a more inclusive approach in which previously excluded groups can define the strategic priorities of research and governance regimes before funds are allocated for potentially damaging programmes.

Time for transformation

Rejecting the philosophy and value system of scientism that underpinned the green revolution, Padma and other experts-through-experience around the world seek further opportunities to embrace more participatory modes of knowledge building and mobilisation. The holistic vision and value systems that underpin this knowledge radically depart from mainstream research and innovation systems. We need to build a framework with people coming from diverse worldviews that is capable of transforming the dominant industrial food system. Only then can we shift towards social justice, sustainable livelihoods and environmental democracy.

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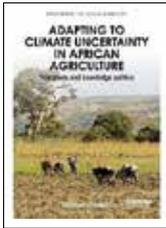
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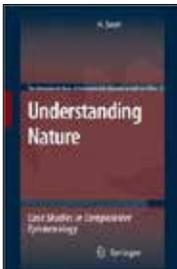
(Twitter: @peepsknow).



Adapting to climate uncertainty in African agriculture: Narratives and knowledge politics

Stephen Whitfield. 2015. Routledge 210 pages. ISBN: 9781138849334

Risk, uncertainty, ignorance, ambiguity –these are not simple words of speech but rather conditions of incomplete knowledge. This book examines the challenges of adaptation in smallholder farming in Africa, analysing the social, economic, political and climatic uncertainties that impact on agriculture in the region and the range of solutions proposed. Drawing on case studies of genetically modified crops, conservation agriculture, and other ‘climate smart’ solutions in eastern and southern Africa, the book identifies how uncertainties are framed ‘from above’ as well experienced ‘from below’, by farmers themselves. It provides a compelling insight into why ideas about adaptation emerge, from whom, and with what implications. Deeply thought-provoking, the book is an important guide for innovative thinkers in the design and implementation of climate smart agriculture in Africa.



Understanding nature: Case studies in comparative epistemology

Hub Zwart. 2008. Springer Netherlands. 286 Pages. ISBN: 9781402064920

‘Real’ knowledge of nature is a notion that we strongly relate to science, and for good reasons. Through research, the sciences have produced robust and reliable forms of knowledge, using methodologies that can usually be trusted upon. At the same time, laboratories and similar research settings are highly artificial environments that constitute rather modified versions of reality. This work departs from the recognition that science is not the only route to understanding nature. Notably, works of literature such as novels, plays, and poems on nature may be based on careful observations, quite elaborate and true to life. Comparative epistemology is a discipline that critically analyses the relative validity and value of various knowledge forms. Drawing upon this disciplinary perspective, this book compares the works of prominent representative of Western science with the writings of their literary counterparts. It is a major contribution to the expanding field of Science and Literature Studies, allowing basic insights from the sciences and the humanities to mutually challenge and enlighten one another.



The diversity of knowledge. Reflections on the Agrobiodiversity@knowledged programme

Henkjan Laats, Edith van Walsum, Janneke Bruil, Danielle Peterson (Eds). 2015. 34 Pages.

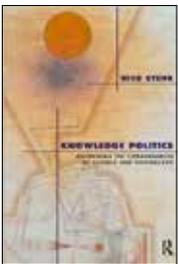
Knowledge about agricultural biodiversity is among the most valuable assets held by family farmers, and a key to their food security and food sovereignty. Despite this importance, this knowledge is disappearing at an alarming rate. In recognition of the need for greater knowledge building and sharing on agrobiodiversity, Hivos and Oxfam-Novib hosted a three-year program to facilitate agrobiodiversity knowledge sharing between family farmers, civil society organizations, and research organisations. Drawing on real experiences, this publication offers insights into international knowledge community building, as well as to the rich diversity of knowledge cultures of the diverse participants. The reflections in this book offer a clearer picture of the ‘backstage’ communication and action required for the agroecological movement.



Living knowledge

Jens Dorland & Michael Søgaard Jørgensen (Eds). 2014. Aalborg University, Copenhagen, Denmark. 379 pages. ISBN: 9788793053021

This publication presents around 30 papers and work-in-progress papers submitted to the 6th Living Knowledge Conference held in Copenhagen, April 9-11, 2014. While there have been some advances in increasing citizen participation in community-based research and in policy processes and decision-making, there is still a long way to go before citizens and civil society organisations are fully accepted as equal partners and providers of knowledge and expertise to solve societal challenges. The Living Knowledge conference stemmed from the recognition that the time has come to recognize civil society as producer of knowledge. The cases presented in this book include innovative ideas and initiatives in agroecology, permaculture, and urban agriculture, which communities and civil society organizations over the world have developed and organised.



Knowledge politics: Governing the consequences of science and technology

Nico Sterr. 2015. Routledge. 252 pages. ISBN: 978159451087

'Knowledge politics' is, according to author Nico Sterr, a phenomenon that has emerged as a consequence of new technologies and society's response to them. This book discusses Western society's response to the wealth of technological innovations developed since the 1970s, including genetically engineered foods, reproductive cloning and the reconstruction of the human ancestral genome. The author explores the fusion of nanotechnology, biotechnology, and transgenic human engineering, whose products may, as its proponents claim, some day cure disease, eliminate pollution, and generally improve human survival. Knowledge Politics shows how human civilization has reached a new era of concern about the life-altering potentials of new technologies. Concerns about the societal consequences of the expansion of scientific knowledge are being raised more urgently and are moving to the centre of disputes in society and to the top of the political agenda. This work discusses the consequences of knowledge politics and society's possible approach to solving conflicts over present and future scientific innovation.



Towards an agroecological transition in Southeast Asia: Cultivating diversity and developing synergies

Jean-Cristophe Castella and Jean-Francois Kibler (Eds). 2015. GRET, Vientiane, Lao PDR. 92 pages.

This publication came into being as an endeavour to provide a broad, yet non-exhaustive, overview of the current situation of agroecology in the Great Mekong Region. Starting from the early 1990s, a multitude of initiatives have emerged in this region for supporting agroecology. The French Agency for Development (AFD) has been an active supporter of these initiatives, especially in relation to the promotion of Conservation Agriculture and the establishment of the Conservation Agriculture Network for South East Asia (CANSEA). The book is divided in two sections. The first one provides an analysis of the diversity of practices, actors and experiments related to the main schools identified in the six countries: organic farming, IPM and integrated crop management, home gardens and VAC, SRI, Conservation Agriculture, and Agroforestry. Section II highlights common challenges for up scaling agroecology in the Great Mekong Region and shows evidence of the interest of regional stakeholders for promoting synergies through networking.



Members of the AgriCultures Network are working together to advance family farming rooted in agroecology. Here is our latest update. Stay posted at www.agriculturesnetwork.org

The Netherlands: Food conference

The second 'Voedsel Anders' (*Food Otherwise*) conference took place in Wageningen, the Netherlands, in February 2016, bringing together over 1000 people. The conference, co-organised by AgriCultures Network member ILEIA, offered over 60 sessions about practical and political ways to make the transition towards fair and sustainable food systems.

The event provided a space for the exchange of ideas and experiences on topics such as agroforestry, seeds, closed-loop farming, short chains, community-supported agriculture, new peasants, urban farming, land rights, and trade policies. It was supported by dozens of farmer net-

works, civil society organisations and research institutes.

Among the keynote speakers were Jyoti Fernandes of La Via Campesina and Irene Cardoso, chair of the Brazilian Agroecology Alliance and ILEIA board member. Olivier De Schutter, former UN Rapporteur on the Right to Food, made a contribution on the role of bottom up learning in transition to more sustainable food systems (see page 29). In a reflection, Professor Jan Douwe van der Ploeg of Wageningen University stated that "this conference radiates power. We see that people in many places are constructing creative elements for the future that lead to new connections, build resilience and contribute to the transition. And much of that starts with struggle". Videos, reports and photos of the conference are available at www.voedselanders.nl.

Ethiopia: First issue of Wegel magazine

The AgriCultures Network is proud to welcome a new member on board: MELCA Ethiopia, a strong and well respected organisation that

works for healthy ecosystems, vibrant cultures and improved lives of communities. Supporting agroecology is a key strategy for MELCA and a starting point for its membership of the AgriCultures Network. Through a collaboration between MELCA and Best Practice Association, YNSD, ISD, Mekele University, PAN-Ethiopia, PANOS Ethiopia and Prolinnova Ethiopia, the first issue of Wegel magazine was produced in January. It is the fifth regional magazine of the AgriCultures Network. The name Wegel is inspired on a traditional Ethiopian farming tool. The coordinating editor of Wegel, Mersha Yilma, is very pleased: "Wegel provides a crucial new space for farmers and other actors in Ethiopia to share, learn, collaborate and act for sustainable agriculture and healthy foods." The first issue, dedicated to the importance of healthy soils, can be downloaded in both Amharic and in English here: www.melca-ethiopia.org.



Measuring the impact of agroecology

The September issue of Farming Matters will explore how to better prove the effectiveness of agroecology. Agriculture and the rural world perform important roles in addressing the multiple crises of today: hunger and malnutrition, poverty, climate change, environmental degradation, loss of biodiversity, water, gender inequity and health. The Sustainable Development Goals, recently endorsed by the United Nations, explicitly mention the need to transform our current input heavy food systems in order to make them more sustainable and contribute to solving these global challenges.

There is ample evidence that agroecology driven by family farmers can contribute to addressing these challenges in an integrated way. But why is it continuing to be difficult to 'prove' the effectiveness of agroecological practices?

One challenge is that farmers' indicators or criteria to judge the effectiveness of agricultural practices differ from those of mainstream policy makers and scientists. The dominant agricultural paradigm sees the maximisation of yields of single crops as a key indicator of effective agriculture. But family farmers may use several additional criteria, in line with the multifunctionality of their farming system.

Innovative farmers continuously assess the effectiveness of their farming practices, because they want to know the added value of new practices compared to what they were doing earlier, or to what others are doing. They carefully observe their crops and their animals to assess the resilience of their

system. They may 'read' their farm's resilience by observing changes in biodiversity, nutritional value, income and risk diversification, health, labour quality and general quality of life.

Because of this discrepancy in indicators it can be challenging to convince scientists, policymakers and other farmers about the effectiveness of agroecological practices. The September issue of Farming Matters seeks to bridge these differences and contribute to a new perspective on indicators for agroecology's multifunctional contributions to society.

What (additional) indicators are family farmers using to assess the effectiveness of agroecology at the farm, landscape and community level? And which indicators are emerging at the aggregate level to assess the multifunctional benefits for agroecology to society at large? How can we show the contributions of agroecology to the Sustainable Development Goals? What are the challenges when demonstrating the impact of agroecology, and how are these challenges overcome? How can we demonstrate in a convincing way the crucial role agroecology can play in responding to the crises of our time? What can we learn from existing practices?

We invite you, our readers, to share your experiences. Articles for the September issue of Farming Matters should be submitted before **1 June 2016**.

at www.farmingmatters.org

COLOPHON

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Subscribe at www.farmingmatters.org

The AgriCultures Network

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Dana Stefov/USC Canada (see article on page 14)

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Agroecologists engage in an intercultural dialogue that accepts that science is not the only way of looking at, transforming, and emancipating the world.

– Victor M Toledo, Page 18

RESEARCH THAT FOCUSES ON TECHNOLOGICAL FIXES WITHOUT ADDRESSING THE POLITICS OF KNOWLEDGE AND THE DEMOCRATIC DEFICIT IN THE GOVERNANCE OF FOOD SYSTEMS AND SOCIETY IS INCAPABLE OF ADDRESSING THE WORLD'S MULTI-FACETED FOOD CRISES.

– Tom Wakeford, Colin Anderson and Michel Pimbert, page 32

A different understanding of transition starts from the bottom and from local solutions, rather than from the top and the centre of political power.

– Olivier De Schutter, Page 29

AS WOMEN, WE HAVE USED CO-CREATION OF KNOWLEDGE TO ASSERT OUR RIGHTS AND TO STRENGTHEN THE POSITION OF RURAL WOMEN.

– Elizabeth Mpofu, Page 9