act:onaid



Climate Resilient Sustainable Agriculture Experiences from ActionAid and its partners

Climate Resilient Sustainable Agriculture is an initiative ActionAid has been developing, based on the science and practices of agroecology (Box 1) and the recognition of people's right to food. It represents an effort to incorporate in our work the new challenges posed by climate change and its impacts on poor people's lives. It is based on the identification of the major risks and challenges local communities now face and likely to face in the future, and on the design and implementation of site-specific adaptation strategies aimed at reducing vulnerabilities and increasing the resilience of the smallholder production systems.

Box 1. Defining Agroecology

Agroecology is both a science and a set of practices. It is the application of ecological concepts and principles to the design and management of sustainable agricultural ecosystems, and its practices are based on enhancing the habitat, both aboveground and in the soil. Agroecological farming builds the health and resilience of ecosystem functions while reducing the reliance on external inputs such as synthetic chemical pesticides, fertilisers and fossil fuels that have high energy, environmental and health costs.³ In fact, the findings from the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) show that agroecology is well-suited to withstanding the environmental and economic stresses posed by climate change, shifting pest pressures, and volatility in petroleum and commodity prices.²

ActionAid's Climate Resilient Sustainable Agriculture Approach

There is no one-size-fits-all model or technological package to climate resilient sustainable agriculture. Real alternatives are rather site-specific; they are highly dependent on the cultural, social, economical, and environmental contexts in which they are generated.

ActionAid is proposing new ways of thinking, rather than distributing ready-made solutions. The starting point of our proposal is to design local alternatives that are based on the knowledge and practices of the communities themselves. Although they are not a panacea to all problems, they contain key insights that—when appropriately combined with scientific knowledge and modern technology—can help us design and promote local food production systems that are more adapted to climate change and in tune with local contexts and needs. Figure 1 summarises ActionAid's three main approaches to and seven pillars of climate resilient sustainable agriculture.

Figure 1. ActionAid's Climate Resilient Sustainable Agriculture Initiative

Three main approaches:

Conducting participatory appraisals to identify local potentials and challenges

Identifying, documenting, testing and disseminating local knowledge/alternative practices and encouraging local innovation

Promoting sustainability through appropriate agricultural research and extension services based on technologies that reduce dependence on external inputs and agro-chemicals, help adapt to climate change, and build on and reinforce local knowledge

With a particular focus on the following seven pillars:



All farmers – from conventional farmers that are heavily dependent on external inputs to traditional smallholder farmers or marginal farmers that rely mostly on internal inputs – can embark on a transition process to a more sustainable production system.

This transition process does not and must not happen overnight. The redesigning of complex production systems requires a series of small, well-planned, and realistic steps. Farmers need to take time to experiment, test, and validate whether the small changes that they are adopting are bringing about positive results to their farms (Figure 2).

Several factors can influence the speed and the extent of the transition process. This process can be influenced by, for example, the capacity of investment within households, the availability of natural and productive resources, the level of degradation of the production system, climatic conditions and so on. Systems that have been subject to huge stress for a prolonged period of time (through overexploitation, overgrazing, soil and vegetation depletion, soil compaction, desertification) will demand more investment in time and resources than a system that is in a healthier condition.

ActionAid's Climate Resilient Sustainable Agriculture Approach

Implementation of Alternatives to be **Monitoring and** Validation and **Definition of** Local Tests Evaluation Changes Diffusion Dested , √ Documentation Knowledge Menu of Practices of Local **Monitoring and Priorisation of Challenges** Evaluation **External Practices** Identification of 1 I ✓ **Building Partnerships** Participatory Appraisal TAATZ

Figure 2. Transition Process to Climate Resilient Sustainable Agriculture



CASE STUDY 1 Improving Food Security in Marginal Areas – Kenya

Key Pillars: Soil Conservation | Sustainable Water Management

Kenya is a country highly dependent on agriculture, despite the fact that less than 20 per cent of the total land area is suitable for cultivation. Agriculture is also the largest contributor to Kenya's economy, with over 20 per cent of the gross domestic product directly coming from the sector. Despite its importance, the government has not given enough priority to the agricultural sector, while the population in arid and semi arid areas continue to suffer from chronic and perennial hunger.

'Improving Food Security in Marginal Areas' is an initiative supported by ActionAid Kenya, the World Food Programme (WFP), the UN Food and Agriculture Organisation (FAO), and the Government of Kenya. This initiative aims to strengthen the livelihood resilience of hunger vulnerable communities in eastern Kenya (Mwingi District) through sustainable agriculture. Specifically, it aims to improve on and off farm water harvesting; promote drought resistant crops with appropriate market linkages; and improve extension services.

In Mwingi, where the population is highly vulnerable to hunger (up to 70 per cent of the population is supported by humanitarian relief assistance), the initiative has encouraged the communities to organise themselves into groups to work on specific sustainable agriculture projects based on the Food for Assets approach.

Building livelihood resilience and adapting to climate change

Climate change has had an adverse effect of lowering the soil moisture content in Mwingi, which has been compounded by the already low precipitation levels. In addition, sudden down pours in the area have caused soil erosion, preventing soil absorption and retention. In order to ameliorate this situation, communities are engaged in various soil and water conservation projects. Though building terraces and using micro catchment techniques, such as zai pits^{*} and semi-circular bunds^{**}, onfarm water catchment has improved in 2823.01 hectares and this has also improved crop growth and overall yields.

Dry spells as a result of climate change has also forced the communities, especially women, to walk long distances to collect water. To tackle this problem, communities have developed permanent water sources such as the Kamwereni rock catchment, which has the capacity to provide water to more than 1,800 people from 300 households throughout the year. With such structures in place, water is now available within short distances. It now takes as little as five minutes to fetch water, without having to walk 8 – 16 km per day.

With improved access to water, communities have now begun to plant perennial fruit trees such as oranges and mangoes to ensure long term food security and to increase soil cover.

Through proactive promotion of drought resistant seeds – such as peas, cowpeas, green grams, millet and sorghum – farmers are now able to harvest crops despite the short-lived rains and ensure food security for their families. Moreover, improving farmers' access to local markets has incentivised farmers to invest further in drought resistant seeds.

In addition to this initiative, ActionAid Kenya is collaborating with academic institutions like Maseno University to conduct research on the nutrition content of indigenous vegetables and crops. The findings of this research has been disseminated in various communities across Kenya and contributed to the improved food security in marginal areas.

*Zai pits are holes dug to catch runoff and allow time for infiltration. The holes are usually fertilised with organic manure. This technique is usually used on land with low permeability.

**Semi-circular bunds are earth embankments in the shape of a semi-circle. The uppermost tips of the semi-circle lie on a contour so that runoff is collected in the lowest section.

For more information, contact:

Philip Kilonzo, National Right to Food Coordinator, ActionAid Kenya, <u>phil-</u> ip.kilonzo@actinaid.org



CASE STUDY 2 Women and Agroecology – Brazil

Key Pillars: Gender Equity and Women's Rights | Soil Conservation | Sustainable Water Management | Livelihood Diversification

In Brazil's semi-arid region, there is a growing and dynamic movement involving union organisations, civil society, communities and organised groups of farmers who have come together to respond to droughts and to farm using agroecological methods. Among the farming strategies used in semi-arid Brazil are water conservation and crop and livelihood diversification.

Rather than planting one crop variety at a time, Brazilian farmers are promoting the diversification of productive species – i.e. the use of numerous varieties of the same species and diversification of planting periods. Indeed, with increasing climate variability, farmers have learned that a single area of cultivation may contain several varieties of beans, broad beans, maize, sorghum, manioc, fruit trees, fodder crops, trees that produce timber and firewood, and so on.

Initiated in 2007, ActionAid Brazil's 'Women and Agroecology' Project aimed to encourage the creation of a forum in which women can exchange their knowledge and techniques on agroecology, and to strengthen their capacity to systematise and reflect on their own experiences.

By bringing together women, who are often absent in such debating spaces despite their leading role in maintaining and disseminating agroecological knowledge, the project aimed to strengthen the identity of rural women, build solidarity among family farming groups, circulate useful knowledge, build women's confidence and achieve individual and collective empowerment.

Over the past three years, approximately 300 women farmers, 60 technicians and 20 civil society organisations (CSOs) were involved in the project, disseminating over 100 experiences from the Northern states of Paraíba, Maranhão, Piauí, Pernambuco, Alagoas, Bahia and Ceará, and the Southeastern state of Minas Gerais.

systematisation process was The uniquely characterised by the rich and diverse participatory methodologies. Some women opted for collective systematisations while others opted for individual ones focused in groups. The majority had the opportunity to meet other women and to exchange their experiences, concerns, problems and solutions. Some created a system of sending and receiving letters, while others made films. Some systematised their experiences through poetry and music. There were several follow-up meetings and seminars in the communities which enabled women to complement and supplement their knowledge around agroecology.

For many, the common notion that women are "helpers" and that their labour has less value than those of men has been demystified. In many cases, the systematisation of agroecology



experiences served to show women and their families the importance women's economic autonomy—including the control and use of income raised by women. It has also opened up discussions about organising and opening women's own markets and increasing access to other farmers' markets.

Politically, it served to unveil the diverse types of oppressions suffered by women. The project has motivated a growing number of women to proactively explore alternative water resources, to take part in the presidency of Rural Workers' Unions, and to come together to discuss issues such as market access and public policies on agriculture.

The final document, *Mulheres e Agroecologia:* sistematizações de experiências de mulheres agricultoras (Women and Agroecology: Systematisation of experiences of women farmers) was published in Portuguese in 2010, and is available on the website of ActionAid Brazil.

For more information, contact:

Ana Paula Lopes Ferreira, Women's Rights Programme Coordinator, ActionAid Brazil, ana.paula@actinaid.org



CASE STUDY 3 Multi-Purpose Farm through Farmer Association Initiative - Cambodia

Key Pillars: Soil Conservation | Sustainable Water Management | Supporting Farmers' Organisations

Approximately 85 per cent of Cambodians live in rural areas and about 75 per cent of them are rice farmers. Many farmers are heavily dependent on rainwater for cultivation due to the lack of local irrigation systems. To increase their productivity, some farmers have resorted to using chemical fertilisers and pesticides which have proven to be harmful for people's health, soil quality and the whole agroecosystem.

To address these problems, Centre d' Etude et de Development Agricole Cambodien (CEDAC) introduced the 'Multi-Purpose Farm through Farmer Association (MPF-FA)' initiative in 2003. Originally started as the 'System of Intensification and Diversification Farm (SID)' in 2001, the MPF was designed to promote an integrated small-scale farming system - including the production of rice, fruit trees, multi-purpose trees, perennial crops, veqetables and seasonal crops, appropriate animals, and fish. In short, the MPF is a system for improving the livelihood of smallholder farmers, whose field sizes range from 0.2 to 0.6 ha and who cannot produce enough food to support their families. As of 2011, there are approximately 500,000 MPF-FA farmers across Cambodia under the direct support of CE-DAC and Farmer and Nature Network (FNN).

The MPF-FA consists of several components:

Ponds and Canals play an important role in storing water as a reservoir for many purposes, including growing crops, protecting rice plants during short drought periods, growing vegetables, and farming fish. An appropriate size of the canal is 1.5 m wide, with sloped walls, and 1 m deep. The size of the pond is usually is 10 m x 15 m or bigger, with a depth of 2 to 3 m.

Filling the upper land with the soil from the digging of ponds and canals is important for the integrated production of crops and animals. In this filled land, farmers can plant fruit trees, perennial plants and vegetables, while at the same time raising pigs, chickens, and ducks.

Building bund dikes, again with the soil from the digging of ponds and canals, can protect the community from floods, protect the fish, and prevent soil erosion. The dike around the MPF is typically 1 to 1.5 m tall and 2 to 3 m wide with appropriate sloped walls and grass on the surface.

Using the System of Rice Intensification (SRI), rice fields can be smaller than before but they can produce yields that are 2-3 times higher than before. In the remaining rice fields (those that remain after converting land for building ponds, canals, bund dikes, and filled land areas), farmers can increase the rice yield with less external inputs by applying some SRI techniques. These include using natural fertilisers and composts, selecting best seeds, keeping the soil moist but welldrained and aerobic, transplanting young seedlings carefully and quickly after uprooting causing minimum trauma to roots, and transplanting seedlings in rows or square patterns laid horizontally and shallow.

Forming Farmer Associations, smallholder farmers can share and exchange cropping

techniques, knowledge, skills, capital, inputs and market information among themselves. Sharing market information is crucial, and with farmer associations in place, farmers can collectively sell their products and demand better prices.

Through Farmer Associations in the form of Self Help Groups (SHGs), farmers can collectively save money and take out loans, particularly for investing on the MPF. These organisations also help smallholders to undertake and practice sustainable agriculture and to gain better access to markets.

Farmer to Farmer Exchanges

Taking this model forward, ActionAid Cambodia has been implementing the Farmer to Farmer Exchange Initiative since 2009, where around 100 selected farmers provide direct training, coaching and mentoring on sustainable agriculture to fellow farmers from different regions. So far, more than 500 farmers have been trained by this initiative in 10 provinces across Cambodia. This initiative has played an important role in enhancing farmers' capacities to improve productivity and household food security in a sustainable manner, and to achieve cohesion and collaboration among community members.

*Farmer and Nature Network (FNN) is a larger farmer association network that was formed by CEDAC in 2003. CEDAC and FNN are working together to promote the MPF-FA through either their respective projects or joint initiatives.

For more information, contact:

Kimtheng Sen, Programme and Policy Coordinator, ActionAid Cambodia, <u>kimtheng.sen@actinaid.org</u>



CASE STUDY 4 Seed Banks for Neglected and Under-Utilised Species - Nepal

Key Pillars: Agro-biodiversity Preservation | Livelihood Diversification

With less than one per cent of the world's area, Nepal is home to a disproportionately large number of plant species. Yet, large numbers of the population are food insecure and hunger and malnutrition are prevalent. Statistics show that the situation has worsened during the past two decades. The worstaffected segments of the population are the tribal and nomadic communities, whose local agriculture and natural resource management systems are jeopardised by public and private programmes built around a high-external input agriculture.

Despite the difficulties they face, Nepal's small and marginal farmers contribute the most to the country's staple food production. In fact, their contribution goes far beyond the six staple cereals; in addition to growing millets and local landraces of rice, wheat and maize, they grow or collect *Amaranthus* herbs, *Urtica dioica* (stinging nettle), *Diplazium* ferns, *Bauhinia purpurea* or *Diosecreta alata* (purple yam).

These species are widely known and used for medicinal and nutritional purposes ; for instance, *Amaranthus* and *Uritica* have high iron content and *Bauhinia* are rich in minerals. These local crops help families meet their food needs, and on many occasions, contribute to their income.

Villagers describe how these crops complement each other in terms of taste, and how some are prized because they fill the gap in the "hungry months" when no other foodstuffs are available. They are also well-adapted to local agroecological conditions and can tolerate local pests and diseases. Moreover, these local crops are produced with low input, requiring no irrigation and fertilisers and allowing farmers to make productive use of marginal lands.

Although their advantages are many, most of these local crops are seen as "poor people's food". There is little or no research and investment in these crops. Farmers also lack extension services and information on how to get higher yields, and they also find it difficult to find seeds or propagation material. Not surprisingly, most of these crops are described as "neglected" or "underutilised" species.

Securing Seeds

Fortunately, there are many organisations that recognise the potential of these neglected crops. Building on the regular seed exchange initiatives that are widespread in rural Nepal, the Sustainable and Equitable Development Academy (SEDA) has been encouraging farmers to get together, with each of them bringing seeds of different neglected species and exchanging them with those from their neighbours. These ideas have been developed further into a "seed bank" initiative, which SEDA started with the support of ActionAid Nepal. The idea of a seed bank consists of:

- Developing a "seed map", highlighting the availability, most important features and productivity of different species and their suitability to local conditions;
- The selection of seeds and the implementation of a breeding programme at a local level with farmers and on their farms;
- The establishment of seed banks (or seed storehouses), where seeds of locally promising varieties are stored in sacks, mud pots or by using other indigenous techniques and structures;
- The distribution of seeds to farmers during the planting season, with farmers returning the same amount of seeds after the harvest.

These ideas have been put into practice since 2007 in the Jumla district, starting in the Village Development Committees (VDCs) of Lamra and Talium, where the local banks now store seeds of more than 60 local varieties, including cereals and legumes. The seed bank in Talium alone has amassed a fund of Rs. 575,000 for local livelihood development. This initiative was extended later to Kartikswami, Garjyangkot and Badki, other VDCs in the same district, and adopted by other organisations.

Adapted from: Khatiwada, B. et al. 2011. 'Neglected No More'. *Farming Matters*. Wageningen: ILEIA, the Centre for Learning on Sustainable Agriculture.



CASE STUDY 5 Groundnut Seed Multiplication Programme – Senegal

Key Pillars: Gender Equity and Women's Rights | Livelihood Diversification | Processing and Market Access | Supporting Farmers' Organisations

ActionAid Senegal has been working in the regions of Fatick and Kaolack to support groundnut farmers since 2002. These regions are part of the former "peanut basin", where peanut farming was not only the main source of income for farmers, but also the key source of nutrients for many people and livestock. Whilst accounting for more than 80 per cent of Senegal's overall exports in the 1960s, groundnut exports plummeted to 40 per cent in the 1970s, and to 10 per cent in the 1990s.³ Despite this so-called 'groundnut crisis', groundnuts still occupy 80 per cent of the total cultivated land in Senegal and 73 per cent of Senegalese farmers are involved in the sector.

The 'Seed Multiplication Programme' of ActionAid Senegal aims to support groundnut farmers, especially women, in organising themselves, increasing productivity, processing and marketing groundnut products in order to improve productivity and income of farmers, and to contribute to the sustainability of the local food system. Below is a summary of the programme's main components.

Strengthening farmers' organisations and movements: First and foremost, farmers were supported to organise themselves at the local level to build solidarity, to share their experiences on groundnut farming, and to overcome the groundnut crisis. Once local-level organisations have been formed, ActionAid Senegal facilitated their membership to the Groundnut Producers' Consultation Framework (CCPA), one of the most powerful groundnut farmers' organisations working at the national level. CCPA is also a member of the National Consultation and Cooperation Council for Rural People (CNCR), which facilitates the cooperation and consultation between smallholder farmers' and producers' federations to ensure sustainable socio-economic development of family farming in Senegal.

Supporting groundnut processina: Through consultations with the local communities, it was found that the best way to cope with the falling groundnut prices is to add value through processing and marketing. In turn, ActionAid Senegal supported the establishment of a groundnut processing unit, which allowed women smallholder farmers to increase their income through various products such as groundnut oil, cake, soap, paste, flour and so on. These value-added products attracted different customers with better remunerative prices, and ultimately contributed to the socio-economic empowerment of women.

Supporting groundnut marketing: Groundnut marketing support began in 2003, immediately following the liberalisation of the groundnut sector in 2002, and went hand in hand with the processing support. Through marketing support, farmers were able to access credit from rural banks and to commercialise their products in local markets. Improving market access has been particularly important in rural areas where farmers are not well organised and are often exploited by the country middlemen.

Supporting seed stock reconstitution: This activity was implemented by CCPA with the support of ActionAid Senegal and the Senegalese Institute of Agricultural Research (ISRA). It started in 2005 with the simple aim of increasing farmers' access to good quality seeds. This was crucial especially taking into account the fact that good quality seeds could increase agricultural productivity by up to 35 per cent.

After the first cycle of seed multiplication (four years), the total seed production amounted to 2964 tons. As a result of this success, CCPA has been certified by the government as an organisation that is capable of producing and multiplying selected seeds. With this recognition, CCPA now participates in the negotiation of groundnut prices and continues to influence the government to provide adequate subsidies to farmers. Moreover, CCPA has now become a credible and respectable farmers' organisation and is now able to access credit from the national agricultural development bank.

Empowering women: In the past, women's role in agriculture was merely to "help" men in cultivating and harvesting crops. Most women still do not have access to or control over land and other means of production, and credit and seed distribution are generally diverted to men. ActionAid Senegal has been supporting women to gain access to and control over land and other productive resources through various advocacy activities. As a result of the programme, women farmers are now actively organising themselves, processing and marketing their products and earning incomes for their families. Moreover, they now play a pivotal role in the decisionmaking process of CCPA.

For more information, contact: **Moussa Faye**, Country Director, ActionAid Senegal, <u>moussa.faye@actinaid.org</u>



CASE STUDY 6

Making the Transition to Sustainable Agriculture - South Africa

Key Pillars: Soil Conservation | Sustainable Water Management | Supporting Farmers' Organisations

For many years, communities in Gamopedi Village in Ga-Segonyane Municipality in Nothern Cape Province of South Africa have gone without adequate government support to access land, water and other resources to produce food for their families. On a number of occasions, an informal group of villagers most of whom are unemployed women and men whose only source of income are social grants - contacted the Ga-Segonyane Municipality office to seek an agricultural subsidy grant from the Department of Social Development. However, they were unsuccessful in receiving the grant as they did not meet the minimum requirements, which included having land ownership, and being organised and registered.

ActionAid South Africa started working with this informal group in Gamopedi Village in 2009. Since then, the group has been formally registered with the municipality office and has received 2 hectares of land from the local Chief to start growing vegetables. With these minimum requirements met, the group succeeded in receiving the agricultural subsidy grant of R 150,000 (approx. USD 18,000) from the Department of Social Development, which was used for building boreholes, water pumps and fences.

In addition to the government grant, the group was supported by ActionAid

South Africa to start the Gamopedi Food Garden Project. Considering the dry agro-ecosystem of area, the failure of hybrid seeds, and the growing unpredictability of rainfall as a result of climate change, the members of the project felt a strong need to transform their farming system and adopt sustainable agriculture practices. Particularly, as the rain season has shifted from six months (October to March) to only three months, farmers faced various challenges to maintaining soil health and conserving water on and off farm.

With training on sustainable agriculture from ActionAid South Africa, farmers are now focusing on soil and water conservation through the use of green manure and composts. Farmers are also using various techniques such as crop rotation, intercropping, and ridge tillage, where crops are planted on ridges formed during previous tillage or seedbed preparation operations. Farmers have most recently started a process of seed multiplication to preserve their local seed varieties and to improve agrobiodiversity.

Although the long-term impacts of this project are yet to be determined, farmers have started seeing improved crop productivity within the past two years, and are now able to produce enough food for their families. Moreover, they nurseries and sick people and to sell the surplus crops to the wider village community. Most importantly, farmers are now more confident and convinced of the need to make the transition to sustainable agriculture in order to build their livelihood resilience and to adapt to climate change.



For more information, contact: **Edmore Mangoti**, Right to Food Coordinator, ActionAid South Africa, edmore.mangoti@actinaid.org

Notes

- 1 De Schutter, O. 2011. 'Agroecology and the Right to Food', Report presented at the 16th Session of the United Nations Human Rights Council [A/HRC/16/49].
- 2 Pesticide Action Network North America (PANNA). 2009. 'Agroecolgoy and Sustainable Development: findings from the UN-led International Assessment of Agricultural Knowledge, Science and Technology for Development'. San Francisco: PANNA. Available at: www.panna.org/ sites/default/files/AgroecoBriefFINAL small.pdf.
- 3 Freud, C. et al. 1997. La Crise de l'Arachide au Sénégal : Un Bilan-Diagnostic. Paris: CIRAD (La recherche agronomique pour le développement).

Acknowledgements



This document was produced and designed by Youjin B. Chung with contributions from Celso Marcatto, Ruchi Tripathi, Philip Kilonzo, Ana Paula Lopes Ferreira, Kimtheng Sen, Bed Prasad Khatiwada, Fatou Mbaye, and Edmore Mangoti. Financial assistance for printing this document has been provided by the International Food Security Network (IFSN). IFSN is co-funded by the European Commission and implemented by ActionAid and 13 official partners. It works in partnership with 1,400+ civil society organisations in more than 30 countries across 5 continents to strengthen national and regional food security and sovereignty networks to ensure the right to food in southern countries.

Disclaimer

The contents of this publication are the sole responsibility of the author and can in no way be taken to reflect the views of the European Commission.

December 2011

act:onaid

ActionAid is an international anti-poverty agency working in over 40 countries, taking sides with poor people to end poverty and injustice together.

ActionAid

International Secretariat 4th Floor, The Mall Offices 11 Cradock Avenue Rosebank 2196 Johannesburg South Africa

Telephone: +27-11-731450 Facsimile: +27 11 880 8082 Email: mail.jhb@actionaid.org www.actionaid.org

ActionAid International is incorporated in The Hague, The Netherlands. Registration number 2726419 ActionAid International is incorporated in South Africa under section 21A of the Companies Act 1973. Registration number 2004/007117/10