CASE STUDY:

THE GREENER REVOLUTION

HARNESSING THE BENEFITS OF AGROECOLOGY

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Location:	Seven project areas in Jharkhand, West Bengal and Rajasthan (India), Chitwan (Central Nepal Region), and Chittagong Hill Tracts (Bangladesh)
Duration:	2012 to 2014 and upscaled through various programms
Donor agencies:	BMZ, Amazone, Erbacher Foundation and Welthungerhilfe
Principle actors:	Development Research Communication and Services Centre (DRCSC), Centre for World Solidarity, Pravah, Society for Promotion of Wastelands Development (SPWD), Vaagdhara, Forward Nepal, Anando, Welthungerhilfe e.V., 10,000 family farms
Aim of program:	To improve production and market access for small-scale farmers in marginalized areas by following agroecological principles and diversifying production and nutrition over the long term

CONTEXT

Food shortages in the 1960s led the governments of India and neighboring countries to introduce 'Green Revolution' techniques, which were heavily dependent on monocropping, hybrid crops and external in-puts (e.g. fertilizers). According to the 2008 World Agriculture Report[1], these techniques increased production in the short term, but the food itself did notactually reach the starving millions: it was either exported abroad or left to rot in storage facilitates. The result is that India has now lost its agricultural crop diversity and the related knowledge, leaving only a handful of high-yield crop varieties. As time went on, the rampant use of chemical fertilizers had major consequences on productivity, including a dramatic decrease in soil quality and fertilizer efficiency, erosion of water aquifers, and pest infestations in crops. Small-scale farmers owning less than a hectare of land each were hit hardest by the fallout of the Green Revolution. Such farmers constitute the majority in every developing country[2] and are responsible for growing 80% of the food available in the developing world. Many small-scaleern farming methods that protect biodiversity and benefit local communities as well as consumer health.

Farmers quickly found that they were unable to pay for expensive seeds and fertilizers, leading them to sell off or lease out land to large-scale commercial farmers. Sustainable Integrated Farming Systems (SIFS) are one potential way to alleviate the negative effects of the Green Revolution. Conceived by the Development Research Communication and Services Centre (DRCSC) and supported by the Government of India's Department of Science and Technology, the system encourages small-scale farmers all over India to contribute their knowledge of indigenous farming practices to a centralized

1 McIntyre, Beverly D.; Herren, Hans R.; Wakhungu, Judi; Watson, Robert T. (Editors). Agriculture at a Crossroads; International Assessment of Agricultural Knowledge, Science and Technology for Development. Washington, DC : UNEP 2009. **http://wedocs.unep.org/handle/20.500.11822/7862** (accessed on March 27, 2018) 2 Smallholders and Family Farmers. Rome: FAO 2012. **http://www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/Factsheet_SMALLHOLDERS.pdf** (accessed on March 27, 2018)

system and communicate the challenges they faced as a result of the revolution. This concept was endorsed in the 2008 World Agriculture Report, which advocated a move away from any form of industrial agriculture dependent on the use of chemicals in favor of modern, environmentally friendly farming methods that protect biodiversity, benefit local communities and protect consumer health.

STRATEGY

More than 10,000 farming families that were struggling to feed themselves from areas of India, Bangladesh and Nepal that suffer from drought and/or scarcity of resources have now implemented agroecological farming methods. They utilize an improved version of mixed cropping, which strives to imitate nature: as well as crops, different types of plants, animals, birds, fish and other aquatic flora and fauna are incorporated into the production cycle as part of a biological community. These elements complement one another: the waste of one species serves as a raw material for another, thereby rendering external inputs are unnecessary.In short, the farm is set up to function as an ecosystem.

1. Capacity building: a one year training course in farm design and technical skills at Farmer Field School (FFS).

2. Designing farmsystems: farmers set up their farms based on available resources and utilize a combination of techniques (soil water conservation, cropping sequence management, multi-tier arrangements, etc.), leading to greater crop yields, fewer fallow periods, and less time/space required.

3. Access to markets: farmers start cooperatives to process, certify, market and distribute their produce together through common facility centres (CFC).

Women are rarely acknowledged for their contributions to the male-centric farming sector in India. Individuals like Sonja Devi (image) are changing this mindset through the adoption of agroecological farming methods. Other than a single rice paddy treated with fertilizer and pesticides, Sonja's three acres of land originally lay fallow. At Farmer Field School, she was taught energy-efficient farming methods, e.g. treating her fields and vegetable garden using rice straw and cow dung collected in a vermicompost pit. She also bought ducks – their droppings feed the fish in her pond, as do any earthworms collected from the dung. She now stores her vegetables in a brick chamber, which keeps them fresh for a week, and uses her cooperative's oven to make rice pops, which are then packaged and sold.

RESULTS

ECOLOGY:

- Unlike high-input agriculture, this agroecological approach protect ecosystems, improve diversity, restore soil microfloran and fauna and safeguard water aquifers, making the farms able to feed the population in the long term.
- Produce and crop diversity enables farmers to cope with climatic, ecological or market issues more readily, e.g. crop disease, price changes, or a low-yield harvest due to unpredictable rain patterns. Staggered harvest times also ensure that income is more evenly distributed throughout the year.
- Rather than increasing the productivity of a single crop, the biomass productivity of the farm as a whole is improved, including food intended for own consumption and market distribution, feed for animals, fuel and recycled biomass.
- Low external inputs and short transport routes reduce greenhouse gas emissions.

SOCIETY AND CULTURE:

- Farmers use their knowledge and experience to find the most effective local solutions.
- They adapt techniques according to local circumstances and share knowledge and experience with fellow farmers, thereby increasing social cohesion.

ECONOMY:

- More autonomy: farmers don't longer have to buy expensive seeds or other synthetic input from major companies or work with intermediaries to sell produce, thus enabling them to maximize their earnings by selecting suitable markets and setting prices.
- Farmers can now process their own raw produce and sell it on local and regional markets due to the influence of co-operatives.
- Cooperatives can create and promote their own regional certification models (Participatory Guarantee System – PGS) based on peer reviews, e.g. for organic farming, thus avoiding the need for expensive external systems. Meanwhile, the availability of local produce improves access to quality food for everybody in the region.
- Farming families have access to healthier, more diverse food sources for themselves as well as fodder for animals, thereby reducing the risk of malnutrition.
- A family-based approach leads to equal rights for women, as they participate in household/cooperative decision-making and become politically empowered.
- Agroecological farming systems are relatively labor intense and create jobs in rural areas.

IMPACT

- More than 10,000 families made improvements to 5,500 hectares of land: they made 650 ha of fallow land fertile and transformed 850 ha of single-crop land to double-crop land.
- The farmers diversified their produce: in the beginning, 77% of farms grew only one crop; now, just under 49% grow two crops, while 33% grows three crops and 7% grows more than three. In addition, 75% of farms grow five to seven different types of vegetables.
- More than two-thirds of farmers (69%) have increased their productivity.
- Most farms are able to cover their input needs by recycling several tons of biomass a year, including cow dung, crop waste and residue, urine, poultry feces, weeds, etc.
- Dietary diversity has improved: 70% of female farmers in Jharkhand now eat at least five food groups (before: starchy staples only).
- Previously, the majority of farmers were food insecure. They are now all self-sufficient. Half of the farmers have surplus to sell on the market.
- Most farmers (88%) have increased their net income, with over half (52%) having at least doubled the income. Half of their cash income is generated from the sale of produce.
- The farmers originally earned around 75% of their income from crops and vegetables that depended on monsoon rains (which, in turn, were affected by climate change). Livestock, poultry, aquaculture and value-added products are now a major source of income.

Data is generated through baseline in 2012 and data collected during 2014 by Welthungerhilfe India.

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