

Regenerative Strategies for Climate Justice

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The starting-point for this paper is a growing concern about the strong and creative tension between what is global and what is local in the context of climate change and food systems. The global expression is undoubtedly powerful, based on large-scale, resource-intensive, agribusiness enterprises operating globally and seeking continued international expansion. But a tide is rising, which is reinforcing the local manifestation and provoking a strengthened commitment to local food systems while enhancing the resilience to climate change. Tragically it is those who have contributed the least to green house gas emissions who are suffering the worst effects of climate change. This presentation will feature a project in the Koraput district of the state of Odisha in India, where 70% of the population is dependent on agriculture in a region where late and erratic Monsoon rains are impacting the course of farming. The region is known for its abundance of paddy fields as well as many varieties of millets, yam, and tuber crops, which are gradually vanishing due to the introduction of cash crops and GM seeds, and the increasing impact of climate change. The constant change in the environment of tribal communities in the region creates an imperative for constant learning. In this context the paper will analyse a project-based-learning and grass-roots campaign 'Grow your own Food' led by the tribal Women's Federation Orissa Nari Samaj, and the local NGO THREAD, to counteract the so called "Climate-Smart Agriculture" (CSA) techniques. CSA in the region is encouraging the use of modified seeds, chemical pesticides, and synthetic fertilizers, as well as high-risk technologies such as synthetic biology, and geo-engineering. This imposition of new biotechnology has been particularly damaging for the local farmers. The paper will analyse how new climate resilient agriculture approaches combined with traditional ways of food growing and drought tolerant plants are improving the productivity of their soils and the nutrition of their meals. The paper concludes by considering the role of Education for Sustainable Development in supporting indigenous communities in climate-vulnerable regions to develop locally adapted agro-ecological responses, while attempting to address the deeper structural changes needed to tackle the root causes of poverty and climate change in the Global South.

The Context

Odisha is the eleventh most populous state in India and home to 42 million people, where agriculture is the backbone of the rural economy and the livelihoods of over 70% of the population. Poverty reduced sharply in the state after 2005, but it is still very high, according to the World Bank (2016).

Although endowed with rich natural resources, in recent years the land, water and air of the region has been subjected to environmental stress through recurring natural hazards, agro-industrial activities and climate change (Panigrahi, 2016).

Situated along the east coast of the country and bounded by 480 km long sensitive coastline, the state is periodically affected by climate risks such as cyclone and coastal erosion. Indeed, Odisha is one of the most vulnerable Indian states to climate

change (Patnaik, 2016), with the Monsoon considered its de-facto 'Minister of Agriculture' as it controls the course of farming. Recent erratic, late or insufficient Monsoon has had a direct impact on the land productivity of the non-irrigated rainfed agriculture cultivated by the tribal villagers, in particular women.

Koraput District in particular was traditionally abundant but has become marginal due to the intrusion of cash crops and genetically modified seeds. Traditional varieties of millets, yam, and tuber crops are gradually disappearing. Sustainable indigenous lifestyles and cultural values are being lost in the process.

Women's Engagement

"You Collector, you Government, you Tahasildar, Have you given us this land, this forest and the treasure under the earth? We have got this gift of the nature and have been enjoying for thousands of years since our forefathers. Who are you to snatch away these from us? We will not allow and fight to save our mother land till death."
Alia Majhi (A Woman Activist)

For the majority of the women in Odisha their lives and livelihoods and living conditions depend on agriculture, forestry and fishing. The tribal women's organisation Orissa Nari Samaj (ONS) reports that overworked tribal women and girls of the region suffer from unequal distribution of workload as they perform much of the agricultural labour and all of the domestic duties. Furthermore, women also suffer from physical and mental abuse and alienation. Fear and stigma often prevent them from reporting incidents and from seeking assistance.

Due to the rampant use of chemical inputs in agriculture and mechanisation of agriculture, the unemployment problem has become acute in Odisha, particularly among the tribal women (Patel and Jha, 2007).

In order to address this convergence of multiple crises a regenerative development project was developed by ONS, a federation with a membership of close to 200,000 tribal women, the Odisha NGO THREAD and Gaia Education. Over two and a half years, the consortium of organisations conducted a series of capacity building activities involving 750 tribal families aimed at increasing their food security through agro-ecological practices, while strengthening the social position of the women.

After extensive consultations, Nabarangpur and Koraput Districts were selected as the most vulnerable communities of the region, demonstrating low levels of food security defined as *"physical and economic access to sufficient, safe and nutritional food to meet their dietary needs and food preferences for an active and healthy life"* (World Food Summit, 1996). Furthermore the tribal communities have also demonstrated low levels of skill development, combined with great aspiration for transformation.

Whole Systems Design Approach

Participatory approaches have been attracting the attention of sustainable agriculture professionals: "Participatory research has emerged as a powerful tool to identify agro-ecosystem indicators in developing countries. Indigenous knowledge thus generated complements scientific information to the benefit of all stakeholders" (Goma et al., 2001, p. 179 cited by Mare and East, 2016).

In this context villagers own their own research process; after all, they are the ones with intimate knowledge of local conditions. Imported Global North “experts” have no place in this process. Sustainable agriculture is not, as Pretty noted, “an imposed model or package;” it is, rather, “an approach to learning about the world” (Pretty, 1995, p. 1250)- the *local* world, the everyday lifeworld in which villagers conduct their lives.

Capacity-building was at the core of this project which looked at village level food-systems in an integrated way: acquiring skills and knowledge alone cannot lead to sustained lines of action if it is not accompanied by a shared vision and determination and a strengthened governance structure built on existing socio-cultural arrangements.

In this context, the community-building component of the project supported villagers, particularly women, to learn by engaging in participatory processes, scenario planning, collaborative communication, democratic decision-making, advocacy and leadership development, strengthening the identity of communities of practice while embracing diversity.

The participatory approach adopted by the project favoured Paulo Freire’s invigorating critique of the ‘banking’ model of education, which regards participants as mere receivers of education, devoid of creative impetus. In contrast, educators were challenged to equip the participants with the practical skills, analytic abilities and philosophical depth, resulting in a non-linear exchange of ideas, experience and knowledge, with facilitators only supporting the communities in their desired direction of progress.

Conducted by experienced facilitators and accomplished listening and trust-builders, the future scenarios sessions (intensive dialogues about future scenarios and positive action in the context of the three sustainability realms of the project – community, environment and livelihood), brought together participating villagers to test out a number of agricultural “scenarios” for the development of their communities.

An experienced West-Bengali facilitator utilised a series of asset-based approaches, focusing on how the women could use their resource base to develop strategies for mobilising, expanding and preserving their natural assets. Asset based approaches address inequality in resource endowments and how to access opportunities, providing a concrete way to measure empowerment and ultimately bring about a sustainable reduction in poverty. These activities supported the diversification of agricultural activities with a view to enhancing livelihoods.

The same trainer, supported by experienced THREAD teachers, utilised Permaculture (Permanent Agriculture) approaches, promoting the concept of ‘conscious design’ and the maintenance of agriculturally productive ecosystems which have the diversity, stability and resilience of natural ecosystems. Members of the tribal communities also joined annual eco-village design courses incorporating locally relevant components of sustainable food production, including mixed cropping, nitrogen fixation, bio-fertiliser preparation and seed-bank development.

Over the duration of the project women acquired the necessary permaculture design skills to support the harmonious integration of landscape and people and reaffirmed the place humans occupy in the biosphere, not as masters exploiting nature, but as co-creators of resilience with the entire construct of life.

Grow your Own Food Campaign

The heart of the project was the campaign 'Grow Your Own Food' to counteract the so-called "Climate Smart Agriculture" (CSA) techniques. CSA encourages the use of modified seeds, chemical pesticides, and synthetic fertilizers, as well as high-risk technologies such as synthetic biology, nano-technology and geo-engineering. This imposition of new biotechnology (Shiva, 2000) has been particularly damaging for farmers in Odisha.

The Grow Your Own Food campaign had two key components: a community learning element incorporating eco-village approaches combined with seed preservation and distribution of seedlings of various fruits and vegetables.

Organic, regionally grown seedlings of different varieties of banana, papaya, eggplant, drumstick, multivitamin, moringa, tomato, cabbage, cauliflower, puthina, chilly, spinaches, turnip and pepper were distributed to 750 families over the duration of the project.

GP Name	Village Name	No. of Families			
		2014	2015	2016	TOTAL
Kakirigumma	Kakirigumma	15			15
Kakirigumma	Kakirigumma (Adivasi Sahi)	14			14
Kakirigumma	Maliguda	9	32	32	73
Kakirigumma	Padapadar	35			35
Kakirigumma	Biraguda	16			16
Kakirigumma	Kudipader	20	25	19	64
Kakirigumma	Uppar Padapadr			35	35
Tunpur	Tariguda	15			15
Tunpur	Jhirjira	17	14		31
Tunpur	Kanjariaguda			52	52
Tunpur	Mathari			26	26
Tunpur	Malbaunsi			29	29
Gaudaguda	Merdaguda	11			11
Gaudaguda	Jamuguda	11			11
Gaudaguda	Jhalaguda			17	17
Gaudaguda	Gaudaguda Parjasahi			18	18
Bhitargada	Dangapaiguda	12	14		26
Bhitargada	Semiliguda	4			4
Bhitargada	Birlaput	20	48		68
Bhitargada	Girilput	9	11	22	42
Bhitargada	Koruguda	34	8		42
Bhitargada	Kapsiput	8	17		25
Bhitargada	Lataput		30		30
Bhitargada	Janiguda		51		51
TOTAL		250	250	250	750

Demonstration gardens were gradually established underpinning classroom studies in ecology, biology and physics relating them to issues as diverse as soil, climate, integral water management, the cycles of carbon and nitrogen, the cycle of life, reproduction, habitats and construction, nutrition and health, and the crucial role of microbes in connecting humans with 'nature'.

Around the demonstration gardens the social sciences were also practiced. Villagers were reminded about sharing, equality, inclusivity and social justice as imperatives for a peaceful co-existence locally and globally. There were also opportunities for exploring democratic decision-making.

The results of the gardens were gradually seen. Most of them displayed the placard "Grow Your Own Food" supporting the dissemination of the campaign to other villages. A manual on 10 different ways to create organic manure making was translated in Orya and distributed to the villagers.

The campaign is continually developing new climate-resilient agricultural approaches rooted in traditional ways of growing food. Soils have been treated as living dynamic systems and the main underpinnings of agricultural ecosystem that provide the interface between agriculture and environment. Drought tolerant plants combined with mulching, fortified composting, vermiculture and vermi-composting, herbal pesticides and green manures have improved the productivity of soils and the nutritional value of their meals.

Tangible Results

With organic manure replacing chemical fertilizers and herbal extracts replacing pesticides and fungicides, crops cultivated under the agro-ecological systems implemented by the project produced significantly higher yields than those raised under conventional agriculture systems.

At the end of Year 1 the impact of the "Grow your Own Food" programme was noticeable: 1.248 kg of eggplants, 1.166 kg of cabbage, 1.122 kg of tomato were harvested from the kitchen gardens. Over and above, banana trees, drumstick, moringa, multivitamin and papaya were growing in abundance.

Higher yields in participating villages were the result of community engagement, access to water, and new skills acquired through agro-ecological capacity building activities. Villagers who experienced success in the first year by earning supplemental income through the sale of surplus produce encouraged and influenced fellow community members.

During the second year emphasis was then given to traditional seeds conservation for sustainable agriculture. At the end of year 14,065 kg of traditional paddy seeds, 7,220 kg of maize, 4,250 kg of ragi, 455 kg of sua millets and 1,780 of niger oil seeds were harvested. Odisha partners affirm that at the end of the project, millets have been popularised in the villages once again.

The results indicated an increased harvest capacity through environmental friendly methodologies which has enhanced the soil quality in texture, erodability, nutrient, moisture balances. Villagers exercised natural management over the land resources and diversified food production through optimum utilisation of undulated land types.

For instance, the millets and pulses demonstrated in the organic vegetable cultivation supported a 25% increase in livelihoods and contributed to reduced poverty and hunger. This has been measured through the income generated by selling the excess produce grown in the family kitchen gardens, over and above the family consumption. The average supplementary income was found in the range between Rs.6.000 to 9.000.

Many of the women encouraged by the agro-ecological techniques and high yield results became advocates of the project approaches and are communicating lessons learned during the market days. Some were confident enough to conduct lessons learned sessions in their villages where they are now demonstrating permaculture techniques with mixed cultivation in prepared beds. They have particularly adopted the multivitamin plant which has added to their food source and increased the nutrition of their meals.

Two kitchen garden demonstrations, and one terrace garden demonstration were carried out at Siddharthvillage and many of the village target group visited Siddharthvillage on market day to learn from the demonstrations. Steps were taken to spread the terrace garden concept and popularize further the “Grow your Own Food” programme in towns.

The project has brought solutions to the intertwined social, economic and environmental factors that, for too long, have denied Koraput communities physical and economic access to sufficient, safe and nutritional food. In doing so, it strengthened their financial wellbeing.

Conclusion

Climate change temperatures are projected to rise and precipitation patterns to change, with more weather extremes potentially reducing global food production (Nelson et.al. 2009). For the last 30 years, the climate in Odisha has undergone a considerable change resulting in the old six seasons of the year turning into practically two i.e. summer and rain (Bhuyan and Mishra, 2014). The variation in day temperature and annual rainfall is now mostly confined to four months of the year, and the number of rain days has fallen from 120 to 90, and become more erratic.

Agriculture- as a major land use—has profound effects on Odisha’s natural environment (Mishra, 2014). The continually changing environment of the region creates an imperative for ongoing learning through participatory methods. This generative learning empowers villagers to take action for sustainable development through well-informed, locally adapted responses as sources of creativity and innovation.

Agriculture economy being the basic livelihood provider to villagers in Odisha has to be understood not only in terms of its productivity but also in terms of its sustainability (Mishra, 2014). Greater alignment and coherence between local government and community organisations through the facilitation of communication and information sharing should secure long-lasting and beneficial government support for the practices of agro-ecological production in the state. Therefore, integrating environmental concerns with agriculture policies to enhance the sustainability of agro-ecological systems is a major policy challenge (Mishra, 2014).

The project examined here adopted an approach to sustainable food production that rejects the resource-intensive, technologically dominated, expert controlled paradigm

imposed by the corporate agribusiness forces of globalisation (Mare and East, 2016). For food production to become truly sustainable, and for agriculture to be capable of feeding the Odisha population it must return to locally-sourced, community-led enterprises managed bio-regionally.

The prevailing model of industrial agriculture, heavily reliant on chemical fertilizers, pesticides, fossil fuels, and a seemingly limitless supply of cheap water, places an unacceptable burden on the Earth's resources (Shiva, 2010). In contrast, this project promoted increased levels of food diversity for tribal communities through sustainable land management, producing better crop yields that contribute to improved nutritional levels and long-term food security.

Furthermore, gender equality promoted in the communities through social capacity building and advocacy leading has improved opportunities for women and community minorities and increased social cohesion. And as tribal women become more knowledgeable, they encourage more diversity in crops and promote greater care for the soil resulting in more economically ecologically viable livelihoods for both women and men.

Through this project the combined voices of ONS, THREAD and Gaia Education have demonstrated their support of climate justice, joining in solidarity with the women of Odisha who, in the face of rapid changing environments, are tackling climate change in their own dignified and increasingly productive manner.

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