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"Mangra"- Exploring the Organization of an Environmental Education Curriculum in a Village Equipped for Sustainable Development

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Suman, Sona and the children of Ogna

Contents

"Ah, bahut acha" Suman said leaning over my shoulder with the heir of a European art critic. I was drawing the view of Ogna from Gandhi Manav Kalyan Society's balcony. Suman surprised me with an impromptu Hindi lesson about the contents of my drawing (tree=per, sky=assmani). I took this as a great opportunity to learn more words about the environment for my independent study project: organizing an environmental education curriculum for the village students. We sat there drawing animals, plants and mountains, exchanging their titles in Hindi and English. So, I was shocked when Suman tore a piece of paper out of her notebook, crumpled it up and threw it over the edge of the balcony. "Suman!" I said "kya pyarivarun ke barai mei?" (What about the environment?). She looked nervous and surprised, but knew exactly what I meant. When she did it again I realized that she was as accustomed to not thinking about the environment as I was to obsessing about it. This was an inspiring lesson for me given the task at hand, and I think she took my second "Nehi! Nehi! Pyarivarun?!" to heart.

The rapid growth of urban centers in the last century has resulted in obvious social stratification and neglect of the natural environment. Not only is the gap between rich and poor increasing, but the resources that supply urban consumption and community development are increasingly depleted without due recognition. These issues are successfully addressed in some communities by drawing example from more traditional practices of ecological management, such as water conservation and local food production. Environmental education could be utilized to aid in the relief of social issues and environmental degradation if the curriculum is specialized for each community's circumstance. Children understanding environmental ideologies and dealing with environmental issues is an integral step towards the future of sustainable

development. An education that provides such awareness will lead to the ecological literacy of future generations. India could be the model country for sustainable development if the education system would adopt a clean perspective and encourage young generations to learn about their social, economic and natural environments and apply innovative perspectives to currently developing processes. There is no reason to follow in the industrial development footsteps of current, global economic powers, especially when these powers are proving to be unsustainable. Rather, India should listen to the traditional ecological knowledge and wisdom of its' people and let these domestic notions guide the socially, economically and ecologically sustainable growth of this developing nation.

Environment and Education in India

Ideas about environmental education and sustainable development vary depending on the individual's or group's perspective. Perceptions of sustainable development and environmental education often focus on natural processes. However, social and economic balances are directly related to the natural environmental and developmental success of a community. For the purposes of this paper, a developing community can be considered one with a growing population striving to create a more encouraging environment for their own social and economic growth. Sustainable development is progress towards the coexistence of social, economic and ecological self-reliance within a community. This perspective on sustainable development was eloquently defined at the Brundtland Commission of 1983 as a system that "meets the needs of the present without compromising the ability of future generations to meet their own needs.[1]" These three discourses: social, economic and environmental, are generally discussed as separate issues. The holistic approach to environmental education considers these discourses related

[1] Stiglitz, Joseph. 2007. Making Globalization Work. New York: W.W. Norton & Company, Inc.

subjects, contingent upon each other. This approach is exactly what a growing community requires to develop in a sustainable way.

The economic discourse is often antagonistic to the social and ecological discourses. The economic success of most countries is measured by their net profit, not by the sustainability of their methods of production or by the standards of living in their communities.[2] The national economy is considered sustainable when the exports and imports of the country are even or leaning towards surplus collection. The net income of the country ideally generates enough profit to comfortably sustain all of the inhabitants of the community, however, generally this is not the case. The profits gained in trade typically do not contribute to the quality of life for indigenous people or wage-laborers.[3] Contemporary economic development is dominated by capitalist, industrial organization and modern technology. When "successful," these economic schemes are rarely complementary to socially sustainable structures because of their natural tendency towards bureaucracy and social hierarchy.[4] The urban, industry-managing citizens collect money and gain industrial power. Meanwhile, the villagers and urban, laborers struggle to maintain a high quality of life while the surrounding natural resources are depleted and their energy is exploited to increase industrial production.

Economic initiatives tend to either be short-term or long-term income generators. Short-term income generators have a tendency to exploit natural resources and social hierarchies because they rely on bureaucratic systems of production. Long-term income generators are generally sustainable socially, ecologically and economically. Without considering the sustainability of an income-generating proposal, an economic initiative cannot thrive for

[2] Stiglitz, Joseph. 2007. Making Globalization Work. New York: W.W. Norton & Company, Inc.

[3] Salmon, Enrique. 2000. Kincentric Ecology: Indigenous Perceptions of the Human Nature Relationship. Ecological Applications 10(5):1327-1332

[4] Marx, Karls and Engels, Friedrich. 1848. The Communist Manifesto. London:

extended periods.[5] The Indian government's National Rural Employment Guarantee Scheme (NREGS) is an example of a short-term income generator. NREGS promises 150 days of work for every Indian household, but does not provide any vocational training for the rest of the year.[6] In Ogna, a village outside of Udaipur, there is a working example of a long-term, sustainable, income generator. Through Gandhi Manav Kalyan Society (GMKS), a number of farmers have received plots of lemon trees and training to responsibly care for the trees. The farmers are not expected to pay for the trees until after their second harvest. Not only will the lemon-tree producer in this situation eventually collect their profit, but the farmers continue reaping the benefit of the crop long after they have paid their debt.[7]

The social sustainability discourse focuses on maintaining human rights, by examining and decreasing the social stratification of caste, class, race, gender, ethnicity, and religion. Environmental growth must cater to egalitarian ideals to achieve social sustainability. The local environment thrives in socially egalitarian communities because citizens focus on the needs of their own community rather than trying to create surplus to meet export quotas, which match the desires of foreign communities. This view of socially sustainable development is antagonistic towards the current system of globalized economic growth in a community, which favors fast production rates from the distribution of labor.[8] The labor required of people in these systems does not contribute to their sustained livelihood; rather it contributes to the conceptualization and existence of social hierarchies.[9]

Lastly, environmental sustainability is often termed "green development," contributing to the perception that it is purely an advocate of ecological protection. Rather, environmental

[5] Stiglitz, Joseph. 2007. Making Globalization Work. New York: W.W. Norton & Company, Inc.
[6] Azim Khan (Personal communication, 29/9/2009)
[7] Naresh Nayak (Personal Communication, 8/11/2009)
[8] Marx, Karls and Engels, Friedrich. 1848. The Communist Manifesto. London:
[9] Stiglitz, Joseph. 2007. Making Globalization Work. New York: W.W. Norton & Company, Inc.

sustainability is the holistic idea that working with the natural surrounding without harming ecological balances, rather than manipulating the surrounding to facilitate fast economic or social growth creates overall self-sufficiency.[10] This idea is clearly visible in various methods of agriculture. For example, in Ogna many of the farmers have recently stopped using pesticides and chemical fertilizers. The soil they are working with is not as healthy as it was in its' natural state because of their previous dependence on these chemical, crop-bandages.[11] When soil becomes dependent on synthetic protection it loses its' natural strength and immunities.

There are ways to rehabilitate the land though; the Greenstring Farm in California is located on rocky land, which was once chemically treated. The farmer, Bob Cannard, whole-heartedly believes in biodynamic farming (understanding natural processes as indicators of soil and plant health) and has been rehabilitating the soil with compost teas and mineral rock-dusts for 10 years. The land produces more crops of better quality every year. Cannard explains, "Bugs are Buddhist agents of mercy," implying that they relieve the weak plants of suffering.[12] "Greenstring" philosophy observes bugs as natural gauges of soil health. Rather than masking soil problems using pesticides, Cannard responds to these natural signals using organic compost teas and mineral dusts to feed the soil. Working with the environment not against it has slowly but surely increased the soil quality, Cannard's income and the quality of his customer's diets.

The economic and ecological situation of any given region is directly linked to the health trends in the community. Clean air, clean water and healthy food all result in healthy bodies and from environmental conscientiousness. Economically egalitarian communities have fair systems of trade so that every citizen can benefit from clean, natural resources. Communities that utilize

[10] Salmon, Enrique. 2000. Kincentric Ecology: Indigenous Perceptions of the Human Nature Relationship. Ecological Applications 10(5):1327-1332

[11] Bob Cannard (Personal communication, 23/7/2009)

[12] Ibid.

traditional ecological knowledge and wisdom often recognize the medicinal properties of healthy, domestic plants and benefit economically from their ecological respect. The interconnectedness of these three discourses is necessary for the enhancement and sustenance of local, natural and societal health.

The environmental sustainability discourse has produced many ideas about how to encourage and develop environmental health. Through a combination of protection (policies that preserve the natural state of the environment), conservation (taking care not to abuse or exploit natural resources) and awareness (education about current issues), campaigns for environmental sustainability have been very influential. Current environmental education efforts aim to understand and utilize the concepts of ecological literacy and traditional ecological knowledge and wisdom. Ecological literacy is knowledge about the relationships and balances in the natural, social and economic environments, accompanied by active participation and awareness of contemporary environmental academia and decision-making.[13] Traditional ecological knowledge and wisdom (TEKW) consists of culturally and regionally specific ideas and practices, which appreciate natural balances rather than attempt to overcome them.[14]

Environmental education is a useful tool for connecting the social, economic and ecological discourses. This holistic approach to education raises awareness of regional issues, enhances the government's core curriculums, increases social and economic understanding through ecological examination, and encourages open-minded attitudes for the future. The ideal environmental education, despite its predominately natural reputation, would include information about social and economic issues alongside ecological ones. Anil Agarwal, founder of the Center for Science and Environment, explains:

[13] Salmon, Enrique. 2000. Kincentric Ecology: Indigenous Perceptions of the Human Nature Relationship. Ecological Applications 10(5):1327-1332

[14] Ibid.

> It is very important to expose young children to the beauties and wonders of nature. But as they grow older, it is important they begin to understand how human beings and human societies interact with their environment for their survival and their growth, how these human interactions become a part of a society's culture, and why it is important to rationalize our relationship with our environment.[15]

Environmental education was once viewed as an extracurricular, but given the increasing exhaustion of natural resources it is a dire addition to pre-established curriculums. In an interview about rural environmental education with Nato Singh, the natural resource manager for GMKS, he explained "Children in Ogna will not use [formal] math and science, these subjects will not help them with trade or vocation. They need to learn about their natural environment in order to understand how to work with it." He argued that some theoretical, core subjects are irrelevant, and children need practical, local knowledge for their society, economy and natural environment to coexist sustainably.[16]

Rajasthan, the desert state, is a region rich in local traditions and constantly struggling with droughts or floods. Many communities have developed technologies using local resources to cooperate with the annual monsoon floods and quick evaporation due to heat. In Laporiya, an agricultural village outside of Jaipur, the farmers have taken to building chaukas, which collect water during monsoon season to store in the underground basin all year. Their farms are lush and produce enough crops to sustain their community all year. In Ogna a similar method has been adopted to collect water and keep run-off from the mountains from flooding or eroding farm-plots. Despite this cooperation with the natural situation, many of Rajasthan's villages suffer from government educations that strive for universal education and create attitudes desiring industrial development for the convenience of plumbing, modern appliances and electricity. These educations tend not to consider the village environment. It is important to search for an

[15] Anil Agarwal- Center for Science and Environment (CSE). Environment Education Unit. http://www.cseindia.org/programme/eeu/eeu-index.htm

[16] Nato Singh (Personal communication, 26/10/2009)

open-mindedness, which recognizes that there are multiple lenses for understanding the world, and that "modern, occidental ones" are not necessarily steadfast. For sustainable development, it is essential to respect traditional forms of thought as well as modern ones and in education, combine them where it is appropriate.[17]

> In postcolonial India, it was what "foreigners decided to teach us" that has continued to be decimated, and that too, as far as the higher levels of the educational ladder are concerned, mostly in English. Other knowledges have not disappeared, but they have been for the most part marginalized to the quotidian, where they are frequently the subject of strictures from the modernizing postcolonial state, condemned as markets of an "ignorance" or even "superstition" yet to be overcome. What such admonishments reveal is that in addition to reigning supreme, modern western knowledge is not seen as "western" at all, but as a particular mode of knowledge; it is knowledge as such, everywhere and for everyone. Today for all "serious" knowledge that is produced in India, whether the site for this production is the academy, the state bureaucracy, or any other, is produced according to the canons and protocols of the knowledge that emerged and was systematized in the West in the early modern period. And this outcome, or "gift," if such it be, is as much the fruit of nationalist strivings as it is of colonial imposition.[18]

That is not to say that government designs or similar education structures between urban and rural schools is an entirely, bad thing. A well rounded, government education should provide students in villages and students in cities with the same foundations for growth and engaging opportunities. In this respect, it is only logical that students in cities and villages both study math, science, social studies and Hindi. However, it is important to recognize that the children have come from entirely different backgrounds, the perspectives they developed about the world before school are different, their goals for the future are different and their obligations outside of school are different.

As such, the "universal" government curriculum needs to allow some variation from region to region. Students in rural areas should learn about their local traditional ecological

[17] Seth, Sanjay. 2008. Subject Lessons: The Western Education of Colonial India. New Delhi: Oxford University Press.
[18] Ibid

knowledge and wisdom, while students in urban areas might benefit more from computer training. Both sets of students can benefit from both sets of skills, but one will be more applicable to each lifestyle and should be emphasized accordingly. These lessons do not so much change the way students think about the world as they change the ways students utilize their education.[19] Education about ecology and traditional practices should not be considered sub par to education about modern technology and computer programming, but rather a set of equally valuable and important skills for maintaining a lifestyle distinct from an industrially progressive one. "With a certain effort and a certain vigilance we can try to desist from reading all other forms of selfhood as leading toward and culminating in [modern, western-imposed education], and thus as being incomplete forms of this one."[20]

In addition to the Indian governments' not-entirely-practical curriculum, teacher absenteeism is a serious problem in the village areas of Rajasthan, where commuting to work can be a tenuous trek for teachers that do not live near their school. In 1987-88 the Indian government designed the Shiksha Karma Project to address this issue.[21] Due to teacher absenteeism, the government recognized that "universalizing primary education" would not be possible between urban areas and desert regions. The Shiksha Karma Project involves the local community in issues regarding child's education by establishing "village education committees" and employing local people with little to no professional, teacher training as "shiksha karmis."[22] Despite the efforts to use local manpower, the education provided is still universally driven and does not consider the life of a villager. Students learn about math, science, history and Hindi in

[19] Seth, Sanjay. 2008. Subject Lessons: The Western Education of Colonial India. New Delhi: Oxford University Press.
[20] Ibid.
[21] Mehrotra, Santosh. 2006. The Economics of Elementary Education in India. New Delhi: Sage Publications India Pvt Ltd.
[22] Ibid.

very theoretical ways while their lives outside of school require practical knowledge of local resources and technologies.

Another government effort to increase the quality of their education system is the "Rajiv Gandhi Swarna Jayanti Pathshalas." The Rajiv Gandhi Swarna Jayanti Pathshalas effort started in the mid 1990s to create schools in villages where there were no schools, allowing tribal children the opportunity to have the education offered in the cities.[23] The areas selected had to have at least two hundred people; forty or more 6-11 year old children; and no school within a one km radius.[24] As with the shiksha karmi project, the village committee was responsible for the selection of teachers, in hopes that the teachers would belong to a community located close to the school and be eager to teach.[25] The government addresses issues like low attendance in rural areas, especially for girls, working children and minorities with the idea that a universal education curriculum will provide equal advantages for everyone. Their plan is to encompass all "alternative schools" and other educational programs into a universal, primary education.

Alternative schools are those that are opened in places where children live, but the government has not supported the opening of a new primary school or where the rigidity of government curriculums do not support the responsibilities of children in the community or at home. They mostly exist in areas with habitations small enough that the cost of opening a government school is not considered effective.[26] These schools, despite their second-class reputation, are often more directly catered to the local situation providing village children with a more realistic and applicable education.

The Center for Environmental Science and the Centre for Environmental Education are

[23] Mehrotra, Santosh. 2006. The Economics of Elementary Education in India. New Delhi: Sage Publications India Pvt Ltd.
[24] Ibid.
[25] Ibid.
[26] Ibid.

two large, Indian, NGOs whose initiatives agree on the importance of environmental education for children. However, these programs find ways to enhance existing, core curriculums with environmental education: social studies classes examine the ecological footprints of various cultures and discuss the socioeconomic backgrounds that might correlate to those footprints and biology classes learn about natural systems and how extreme pressures on certain resources impact the balances in natural systems and offset social development.[27] These multidisciplinary and interdisciplinary methods of incorporating environmental education into core classes provide children with the training they need to contribute to sustainable development in a rural area or an urban center.[28] They branch "alternative school" initiatives into government curriculums, however the organizations are not large enough to influence every school.

The Indian government's own environmental education leaves much to be desired in a village community with so many local resources to learn about. The established curriculum is entirely theoretical and leaves kids with very basic impressions of the ecosystem. There is no influential substance about environmental protection or practical importance because there is no incentive for children to practice what they have learned and no relationship between the text and the local environment. When prompted with the question "What is the environment?" children at Galder village school simply answered "tree" or "animal." When asked why the environment was important the children would say "clean air" and "water." The follow up question about whether they would like to stay in the village or move to the city, provided similarly disconnected answers. Many children responded that they wanted to move to the city to have motorcycles, fans and high profile jobs. The government's environmental education for lower

[27] Anil Agarwal- Center for Science and Environment (CSE). Environment Education Unit. http://www.cseindia.org/programme/eeu/eeu-index.htm

[28] Centre for Environmental Education (CEE). *Education for Children.* http://www.ceeindia.org/cee/children.html

schools has done nothing to curb industrial attitudes and desires, even in villages where there is such a rich identity to find in nature.

NGOs that organize alternative education are better able to get to know a community and apply regionally specific ideas to the curriculum. In Ogna there had been issues with children not showing up at school because their parents did not think it was necessary. Gandhi Manav Kalyan Society (GMKS) established children's self help groups which check up on children who do not attend school to encourage them to join the other students.[29] This has resulted in a stronger sense of leadership among the local, tribal children and a higher rate of attendance in the schools. The self-help groups are also able to talk about what would benefit their education and suggest these ideas to GMKS and their schoolteachers.

Since 1985, GMKS has been working as a "catalyst" with the tribal communities surrounding Ogna.[30] Their goal is to protect the tribal communities from competition with industrial initiatives and create locally governed, sustainable livelihoods. They have helped many villages manage local resources and develop in ways that are sustainable for their own community and the surrounding environment through "awareness raising, organization, education and conscientization."[31] GMKS approaches many issues in the communities around Ogna by focusing on: "tribal, Kathodi development, drought mitigation, environmental regeneration, natural resource management, community health, local self-governance, woman and child development and well being, sustainable agriculture (organic methods), community health and sanitation, income generation programs, capacity building and local skill development."[32]

[29] Miniji (Personal Communication, 28/10/2009)
[30] Gandhi Manav Kalyan Society (GMKS). 2008-09. Annual Report. Udaipur: Gandhi Manav Kalyan Society
[31] Ibid.
[32] Ibid.

Most of their efforts are focused on the child development program (CDP) campaigns. GMKS recognizes that the future of Ogna lies in the hands of the children, so if the community is going to develop sustainably than the children will be the ones making most of the decisions. The CDP focuses on basic education with their reading skills improvement program (RIPS) and school quality improvement program (SQIPS), early childhood care, health, sanitation, nutrition and economic development through their livelihood program (LEEPS) and the sponsor-relationship program.[33]

The efforts related to education attempt to decrease the local rate of school dropouts, increase the number of girls attending school and increase teacher availability. GMKS conducts teacher training in 17 villages surrounding Ogna and talks to families about the importance of female education.[34] The SQIP focuses on one school at a time enhancing the school infrastructure, learning levels of the children and teacher training. The RIP provides schools with basic reading resources and appoints more teachers to difficult areas.[35] The efforts related to participation for the children provide students with more leadership responsibility and give students opportunities to practice their skills and talents. GMKS is currently shifting its' focus almost entirely to raising exposure, awareness, teaching and training among children with the idea that these efforts will carry with them into adulthood.

Hibernating Possibilities

The successful, sustainable social and economic development of India is contingent on appreciating the natural environment. If there are not enough natural resources to support the local population, there are certainly not enough resources to support an export industry. Food and

[33] Miniji (Personal Communication, 28/10/2009)
[34] Ibid.
[35] Ibid.

water are simple, yet vital connections between contemporary societal needs and the natural environment. The availability and distribution of these resources in India is a large impediment on the sustainable development of the country.[36] Also, with industrial development, sometimes an easy short-term solution for distribution dilemmas, comes more waste production. For sustainable development an improved system of local food and water distribution and a system for reusal or disposal of waste need to be implemented. Methods of distribution and disposal affect the ecological balances of the natural environment and indirectly affect the sustainability of everything else within the country.

Food production and distribution in India is an issue directly linked to environmental, social and economic sustainability. The increasing insistence on organic and biodynamic methods of agriculture is beneficial for the health of consumers and rehabilitation of ecological balances. However, only a small percent of Indian farmers have been able to escape from practicing mono-cropping and using synthetic pesticides.[37] Some people cannot afford to produce fewer crops using organic methods, or purchase more expensive organic produce.[38] The poor distribution of edible resources in India is due to the social hierarchies and economic inequities between farmers and consumers; the environmental degradation caused by industrial agriculture is a result of economic incentives dictated by these social inequalities.

Water conservation is another socially linked, obstacle for the sustainable development of India. India accesses a surprisingly low amount of safe, drinking water given that the country holds 16% of the world's population.[39] In some areas water has to be rationed for considerable

[36] Guha, Ramachandra and Martinez-Alier, Juan. 1997.Varieties of Environmentalism. London: Earthscan Publications Ltd
[37] Ibid.
[38] Naresh Nayak (Personal Communication, 8/11/2009)
[39] Guha, Ramachandra and Martinez-Alier, Juan. 1997.Varieties of Environmentalism. London: Earthscan Publications Ltd

periods every day. In many rural areas women spend all day, every day walking to and from a water source to collect water for their community. This keeps girls from going to school and women from contributing to their community in developmentally beneficial ways.[40]

Furthermore, some communities that do live in harmony with their local natural resources are becoming victims of natural resource exploitation by industrial companies. The Dongaria Kondh grow up learning about natural resource conservation, judiciously hunting and gathering so that they do not exploit the resources that sustain them.[41] These people, who have lived in the Nyamgiri Hills near Orissa for over 1000 years, are currently threatened by Vedanta, a UK based mining industry. Vedanta plans to extract the bauxite from within the hills they call home. This bauxite is important for water absorption into the hills, which encourages plant fertility and prevents soil erosion.[42]

Vedanta is arguing that the rise in economy brought from a mining industry will increase the Dongaria Khond's standard of living, giving them income and opportunities for formal education. However, the Dongaria have an already established self-sufficient economy, they value equality within their community and they relate a strong sense of TEKW from one generation to the next. "Dongaria culture is sustainable in the true sense of the word, in that it is a way of living in which people have been interacting with nature for hundreds of years without damaging the ecosystem."[43] It is ironic that not only does an industrial, mining scheme claim they will help the Dongaria but they also imply that the Dongaria are in need of development. The Dongaria exemplify how well communities can thrive without industrial development,

[40] Guha, Ramachandra and Martinez-Alier, Juan. 1997.Varieties of Environmentalism. London: Earthscan Publications Ltd
[41] Living Farms. 2009. Saying No to Mining: Endangered Tribals up against the terror of Vedanta. Seedling, July.
[42] Ibid.
[43] Ibid.

teaching environmental practices which are in harmony with natural cycles.[44]

In some situations, it seems there are no better solutions than to manipulate land for social success. GMKS has built wells and dams for some communities around Ogna and run-off catches for farm plots. These water management systems collect water from the surrounding hills reducing the work required by villagers to fetch water, but these systems also require maintenance of the hills so that erosion does not contaminate the water supply.[45] These people could move closer to naturally occurring water sources, but they have already established their villages. They could practice dry cropping, but their crop production rate and income would significantly drop. They could establish a system for population control to reduce resource rationing, but this might lead to other social issues such as skewed gender-ratios in a society that values men more than women.[46] Despite the benefits of this system for the people and even the land, it is valuable to acknowledge that the natural resources are being manipulated to some extent.

This obstruction between social and environmental coexistence often wrongly points communities towards industrial development.[47] Such is the result of the globally accepted idea that economic success is technologically and consumer driven. However, in most instances industrial development is the greatest contributor to the degradation of the natural environment.[48] Gandhi's model economy was that of an environmentally and socially self-sufficient village. He argued that local resources should be accessible for local people, as demonstrated by his 'salt walk'.[49] He supported the idea of a community that grew their own food, wove their own fibers

[44] Ibid.
[45] Naresh Nayak (Personal Communication, 8/11/2009)
[46] Hadevi Singh (Personal Communication, 8/11/2009)
[47] Stiglitz, Joseph. 2007. Making Globalization Work. New York: W.W. Norton & Company, Inc.
[48] Guha, Ramachandra and Martinez-Alier, Juan. 1997.Varieties of Environmentalism. London: Earthscan Publications Ltd
[49] Gandhi, M.K. 1983. An Autobiography: My Experiments with Truth. Ahmedabad: Navajivan Press

and knew about the natural balances of their own ecosystem.[50]

The needs of India's growing population are partially satisfied by industrial development.[51] However, 50% of India's population's livelihood is related to rural agriculture. It is not nationally considerate to focus the energy it takes to industrially develop on the urban sectors.[52] Industrial capitalism, in practice, leads to a loss of touch with ecology, whereas Gandhi's rural, communitarian, ashram model encourages close, healthy relationships between nature, society and the economy.

Even after "successful," industrial development there is an increase in the amount of waste produced by communities. While the Indian government has recognized waste disposal in metropolitan areas as an issue that needs attention, they have yet to design a national solution. A recent India Times article discussed the Municipal Corporation of Delhi's (MCD) initiative to provide "financial incentives" to "entrepreneurs who offer their expertise to assist the [MCD] in garbage disposal."[53] The article described that this was part of MCD's most recent five-year plan and that the incentives would be subsidized land rates and discounts on equipment needed to dispose of waste. The article detailed one proposal, which aimed to produce fertilizer from biodegradable waste and "harness the gases emitted from the garbage."[54] While this issue has been recognized by MCD, there is still a lot more to recognize about the social, economic and ecological impacts of environmental decline.

The environmental curriculum design for Ogna was initially an effort to help GMKS collect information about the ecological, social and economic focuses of environmental

[50] Gandhi, M.K. 1983. An Autobiography: My Experiments with Truth. Ahmedabad: Navajivan Press
[51] Azim Khan (Personal communication, 29/9/2009)
[52] Ibid.
[53] Sinha, Bhadra. 2002. Subsidies for Garbage Disposal: The Times of India. 23 June
[54] Sinha, Bhadra. 2002. Subsidies for Garbage Disposal: The Times of India. 23 June

education, specifically pertaining to Ogna. The plan was to work directly with the staff at GMKS to understand their goals for Ogna's development and to create a list of environmental issues specific to Ogna. Than, to interview community members and gather insight into the traditional ecological knowledge of the area and the desires of the people living outside of the market area. This collection of stories, ideas and resources would help GMKS design an environmental education course to apply to the pre-existing school curriculum. As a form of knowledge dispersal the course would culminate in a development project or showcase, so that students could share information with the rest of the community.

The benefits of this design were many: by the end of the curriculum students would gain an awakened appreciation for the beautiful environment surrounding Ogna, gain practical and traditional knowledge regarding Ayurveda and agriculture, become more reliant on local resources and thus more self-sustaining, and encourage healthy lifestyles within the community while learning about sustainable development. For GMKS this curriculum would enhance their environment and child development initiatives. The curriculum would result in an increased sense of community pride and possibly make Ogna a model of sustainability for the greater Indian subcontinent.

Budding Concepts

The interview process was an integral part of designing this environmental education curriculum. Interviews allowed community involvement so that not only would the content of the course be about sustainability, but the course itself would be sustainable. Without community involvement the course would have been no better than the environmental education offered by government issued books. Members of Ogna from tribal children to Panchayat leaders to NGO

staff contributed valuable ideas and helped determine what aspects of environmental education were important to focus on in this community. Nearly all of the ideas for the course were taken from interviews and nearly all of the ideas expressed in interviews were included in the course.

Across the board, every interview candidate agreed that it was important to include children in the designing of the course if the course was to teach them, just as it is important to include the community in the design of the course if the course is for that community. Naresh Nayak explained, "the curriculum makes the children, it is up to the children what kind of people they want to make."[55] The name of the course, "Mangra," means "forest" in the local language, Mewari, and was contributed by Nemichand Garasia, a Panchayat leader. He also humorously explained, that he understands the desire for economic development that many children in the area have, but he values the health benefits of environmental sustainability over the threat of robot domination.[56] Danjuram Veara contributed the idea of a "forest safety committee," a group of children that is responsible for a section of government-protected land, as well as the idea to incorporate a pen pal program.[57] Many people discussed the need to address development issues and the benefits of living in a village in the curriculum; Mini Garasia, an elementary school teacher, suggested incorporating traditional farming practices into the organic agriculture lesson while Babula Garasia suggested incorporating Ayurvedic knowledge into the community health lesson.[58] Punamchan Neghwan, an elementary school principle suggested creating school gardens at all of the trial sites.[59]

The children who were interviewed provided more information about what they already knew about the environment, than suggestions about the course. Still, their enthusiasm in

[55] Naresh Nayak (Personal Communication, 8/11/2009)
[56] Nemichand Garasia (Personal Communication, 8/11/2009)
[57] Danjuram Veara (Personal Communication, 9/11/2009)
[58] Babula Garasia (Personal Communication, 10/11/2009)
[59] Punamchan Neghwan (Personal Communication, 11/11/2009)

response to curriculum suggestions was used as an indicator of whether the idea would benefit the program. For example, students were genuinely excited about having the responsibility of teaching other members of the community what they learn, so the curriculum was designed with the intention of older students teaching younger ones. Also, the students preferred the idea of visiting sites to having guest lecturers, so fieldtrips were incorporated into the curriculum design.

Some challenging ideas presented in the interviews were easily incorporated into the course after brainstorming with GMKS' staff. For instance, one class of younger students and a few older members of the community emphasized the importance of using Mewari, rather than Hindi or English. So, the translation of Hindi material became part of the task for the students interested in teaching other, younger students the curriculum- this will not only assure that these students know the curriculum material, but will also give them more leeway in emphasizing aspects of the course they deem important. A few classes of students' predominately desired industrial conveniences and had no incentive to care about an environmental education curriculum. After meeting with these classes, a lesson on sustainable development was incorporated into the program and an introduction to the benefits of a healthy environment was placed as motivation to participate in the entire course. Lastly, one interviewee suggested that we apply for grants to contribute to the budget, but Naresh Nayak decided instead to incorporate parts of the curriculum proposal into the environmentally themed winter camp, which already had a budget, as a pilot test for the "Mangra" course.

Ideas from interviews, research, and trial and error developed into a weeklong course/camp that incorporates traditional and modern knowledge about the importance of environmental sustainability. The course is holistic beginning with attention grabbing exercises and lessons about basic environmental importances and progressing into a collection of

sustainable responsibilities and applicable knowledge from every lesson. Over the course of the week students gain more responsibility for applying the knowledge they have acquired and by the end of the week they are ready to teach younger children what they have learned, discuss models for sustainable development in Ogna and create their own environmentally inspired projects. They have freedom to adjust the course to their interests through creative exercises and role-play. As incentive to keep the community wonderful, the students are given leading positions in Ogna's sustainable development, through the responsibility gained in this course.

After the design was completed the curriculum was introduced to a group of 250 tribal children at GMKS' child's day celebration. The celebration focused on explaining child rights and celebrating that these tribal children were able to attend school. The introduction to the curriculum was brief, but the highlights included were descriptions of a visit to Udaipur- the nearby city, Dharamitra- GMKS' organic farm, resources to start their own school gardens, knowledge gained to teach the rest of the community, possible American pen pals, playing games, making skits and painting murals on school walls. The children reacted with enthusiasm and afterwards they all signed a banner that said "*pyarivarun bacha*," meaning "Save the Environment."

The Curriculum

Mangra: GMKS' Environmental Education Curriculum
Abi Phillips, SIT India: Culture and Development 2009

-Throughout the week of lessons students should collect as much plastic and waste from the roadside as they can find -- to be examined on the final day.

Lesson 1: *Introduction Discussion*

-Introduce students to issues related to the natural environment using taste tests, pictures of the affects of environmental degradation and drawing exercises.

-Food: Organic- Chemicals used on soil and plants eventually ends up in our bodies; organic foods only contain minerals and nutrients from the soil. The pesticides and fertilizers on non-organic plants pollute bodies of water; this disturbs ecological balances and through evaporation pollutes the air we breathe.

Local- Food that is grown locally tastes better because it is fresh, and it is better for the environment because there is no petrol burnt for shipping produce across the country or globe.

-Health: a healthy natural environment means clean air, food and water; as a result all the animals in the environment (including people) are less likely to be sick.

-Development: The benefits of using local resources more than imported resources are endless. Using local resources is more sustainable economically and socially for communities because local resources provide local industries and create local job markets. Communities that use local resources are independent of global economic pressures when they sustain their own job and production markets. There is also less cost on the environment when using local resources rather than imported ones -- self-reliance is environmentally sustainable.

Questions to pose: Ask students to write or draw about these questions for 5 minutes and than discuss them in small groups.

-What is a healthy environment?

-What does Ogna need to change or maintain to keep a healthy natural environment?

Lesson 2: *Ecology*

Guest Lecturer Name:
Contact info:

Lecture Topics:

-What species rely on other species in Ogna?

-How do the people of Ogna rely on the natural resources and animals in Ogna?

-How do people give back to the environment?

Twine Exercise: All of the students stand in a circle; they each choose a different part of the environment (ex: soil, water, mosquito, cow, grass, person, air, mountains…etc.). One person holds one end of the twine and throws a ball to a person they depend on (ex: mosquito throws to water because mosquitoes need water to lay their eggs). This continues until each student is holding a piece of the twine and there is a web of twine in the middle of the circle. Than the teacher says one animal has become extinct or one resource has been depleted and the corresponding student lets go of the twine and the rest of the students can feel how they depended on that resource (ex: the teacher says "water

is used up" and the mosquito can feel the effect when water releases the twine). One by one each student's animals or resource disappears and the students let go of the twine. After everyone has let go, the students can see "environmental collapse."
-Have the students discuss the importance of every aspect of the environment and of maintaining natural balances.

Role-play: The students make a skit or song about dependency on natural resources.
Ideas: What happens when natural resources are depleted? How can humans protect natural resources?

Lesson 3: *Agriculture*

Guest Lecturer Name:
Contact info:

-Dharamitra: students visit GMKS' organic farm, learn about composting, traditional farming techniques, the benefits of organic agriculture, how to harvest the crops that are in season and taste fresh produce.
-Afterwards pose the question: How does organic agriculture sustain the environment and community?
-Students will also learn how to grow plants from seed and take care of the plants so that they produce healthy fruits.

-School Garden: students can begin to design a garden for their school; here are some things to consider:
-Where will the garden go?
-What is the layout/design?
-What plants will benefit the school?
-How will the school use these plants?
-How will the students care for these plants?
-When will the students take care of the plants?

-Role Play: Students mimic something they learned about at Dharamitra, they can organize their bodies to mimic a flourmill or make shadow puppets in the shape of farmers and growing vegetables.

-Creative exercise: The students can draw the most interesting thing they learned about at Dharamitra or write a creative short story from a vegetable's perspective (ex: what is it like growing from a seed into a plant? How do chemical pesticides and fertilizers affect the vegetable's life? What does the vegetable want in life? Who are the vegetable's friends?)

Lesson 4: *Local Community Health/ Global Warming*

-Guest Lecturer Name: Lecturer 2:
Contact Info: Contact Info:

Topics: Ayurveda and Natural Resources: students will be led into the woods to learn about and identify the plants typically used in Ayurveda treatments and about the importance of a natural environment for the health of the community.
-Benefits of living in a village: Lower cost of living, higher health ratings, plethora of natural resources, the feeling of belonging to a community, safety, beautiful natural surroundings, food that tastes better: what will urban global citizens do if food is not

shipped to them and they do not know how to grow it?
-Discuss global warming: rising water levels: flooding coasts, fluctuating temperatures, unpredictable weather: El Nino, earthquakes, and hurricanes, ozone depletion.
-Causes → air pollution has built up over time and burned a hole in the earth's protective shield (the ozone). The rays from the sun continue burning the hole and warming the earth. Over time this gradual temperature change melts ice caps, which affects water levels, wind directions and the ability to predict natural disasters.

Lesson 5: *Udaipur Trip*

-Visit Mardri, an industrial area in Udaipur. Ask the students to observe:
-Air and water pollution
-Litter
-Wildlife
-Visit Debari (Near Hindustan Zinc), the waste dump, and landfill. Ask the students to observe:
-Garbage: What can be reused? What is excessive?
-Discuss the harmful affects of plastic on the environment: toxins from manufacturing, non-biodegradable waste build-up, PBA (chemical leaching) and animal deaths.
-Visit veterinarian- Name:
Contact info:

Talk about the effects of plastic and litter on animals that eat it, particularly cows that wander the streets during the day.
-Visit alternative energy center- Name:
Contact info:

Learn about solar power, hydropower, wind power, recycling, reusable and biodegradable resources.
-Visit Gulab Bhag, the largest city park in Rajasthan- discuss urban efforts to reverse environmental degradation:
-Talk about urban gardens and parks
- In Bangalore there is a small movement of communities that share a plot of land near their houses to grow organic vegetables for their families. They get fresh, healthy food, feel like they are part of a small community and contribute to the amount of "green space" in the city (check out RUAF: resource centers on urban agriculture and food security).

Lesson 6: *Sustainable Development*

-Why develop? Ask the students to brainstorm and than discuss:
-Higher education
-Modern technology (electricity, plumbing, appliances…etc)
-Opportunities for employment
Important point: These are all valid desires but it is important to consider how development affects the sustainability of the natural environment and community.
-Discuss sustainable development: The idea that a community develops in a way that is beneficial or benign for the economy, social structures and natural resources.
-Discuss the idea to "Reduce-Reuse-Recycle" (use plastic as an example):

-Reduce: use less of the resource
-Reuse: use the resource multiple times before disposing of it
-Recycle: rather than dispose of the resource, turn it into something used for another purpose

-Examples of sustainable development:

Ecotourism→ tourists from India or other countries could visit Ogna to observe an environmentally sustainable community, learn about traditional tribal practices related to agriculture and environment and bring ideas back to their homes. The state of Sikkim uses ecotourism as a method of generating income, creating local jobs and protecting natural resources. They have also legally restricted agriculture to organic methods.
Specialized Markets→create a commodity to export that benefits the natural environment and generates income. Darjeeling exports tea all over the world, but they maintain a healthy ecosystem to support the land that they use to grow tea.
-Discuss other ways that Ogna's community could develop enough that they are able to establish a larger job market, higher education institution and modern technology without causing harm to the natural environment.

Lesson 7: *Course Summary and Projects*

-Examine trash collection: How much did the students collect in one week? How much could the students collect in a month? A year?
-Moral: if everybody recycled or stopped littering there would be less to clean up, less pollution and a healthier environment. Ask the students about the "Reduce, Reuse, Recycle" lesson. What were the main points? How are these possible?

-Project 1: Ask the students "who is interested in teaching younger students about what they learned in this curriculum?"
-Have the interested students decide what to teach the younger students; emphasize art, stories, skits, songs, games and making toys out of natural resources in these lessons.
-Translate these lessons into the local language, Mewari.

-Project 2: Organize a school garden, create a firm plan and decide which students are responsible for what part of the garden.
-Create a timeline: When will the students dig? Plant? Water? Harvest?

-Project 3: Meet with a local artist to plan an environmental message mural.
- What lessons will be included in the painting? Should the mural consist of multiple images? Is there a way to combine all of the lessons into one mural: Ecology, Agriculture, Local Community Health, Industrialization and Sustainable Development?
- Why were these lessons important?
-How will the students depict these lessons?
-Where (which school wall) will the painting go?
-When will the mural be completed?

Future Additions to the Curriculum:

-Abi will organize a pen-pal program with students learning Hindi at the University of Washington (in Seattle): in the letters students from Ogna can discuss what they know about the environment as well as practice using Hindi and English.

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Additional Curriculum Resources:

Center for Environmental Education (Rajasthan office)
98292-55912

Center for Science and Environment
www.cse.org

Kids for Saving the World
www.kids4savingtheworld.edu

International dialing code+ 651-341-9604

aparryphillips@gmail.com

Ripening Design

GMKS conducted an "Environmental Education Curriculum Winter Camp" from 22/11/09 through 24/11/09. The camp used ideas from the "Mangra" curriculum as activities for the tribal students who participated. Overall the camp was a great success. It served as a good example of how an environmental education camp will work. All of the activities were beneficial for the student's understanding of environmental concepts, as shown by their responses. Though it is valuable to note that the students enjoyed activities that were physical more than theoretical exercises and lectures. A full version of the curriculum in a camp will allow time for more physical activities and visits to places like the veterinarian or discussions about the importance of these issues.

On the first day of camp, twenty tribal students attended; three female, seventeen male, their ages ranged from 6-17. Two volunteers from Shikshanther, an environmental NGO based in Udaipur joined the GMKS staff to help lead games and theatrical activities. The group also toured Dharamitra, GMKS' organic farm, and learned about organic farming methods from Laxman Raval, a GMKS employee and organic aficionado. They learned about milling processes for grains, harvesting of a few different crops, a little about animal husbandry, vermicomposting and compost-teas, natural resource building, and the Ayurvedic properties of ginger, among other crops. They were also given a sample of safed muesli, a root with many medicinal qualities, to try. After breaking for lunch, the students came back together to play more games and make skits about environmental protection. The "get-to-know-you" games and activities

encouraged the students to act freely, dancing, singing, and making animal noises.

These games encouraged the students to loosen up and be willing to participate in activities more directly related to the central theme of the camp. However, their preconceived notions about environmental protection made it difficult for them to be creative with the skits; all of the skits were about discouraging tree harvesting. The camp leaders decided to brainstorm overnight and come up with a new skit for the students to practice in the morning. They designed a very clever skit that would translate well with a public audience. Allowing the children more responsibility in the design would be a good exercise for the end of the camp when students have been introduced to a broad scheme of environmental ideas.

On the second day the camp size shrank by six male students because they had to return to school. If the curriculum is not to be used in school, but as a separate camp, it is important to consider that the students do still need to attend their regular classes. In the morning the leaders described their skit plan to the students and they began rehearsing. There were two main roles and everyone else participated by drumming, chanting or holding the "Environmental Education Curriculum Winter Camp" sign. In the skit the students yelled to community members to come see the big snake that lived in their market and eventually revealed that the "snake" was plastic, implying that the toxins released from plastic production and consumption are as powerful as the toxins in a snake. When they were done rehearsing the students made two sizes of bags out of newspaper to give to shopkeepers during the skit, to encourage them not to use plastic ones, than they paraded into town.

The students were nervous for their first performance, but after each performance their confidence increased and the audience's response encouraged their self-assurance. The last performance at a school had the audience laughing hysterically. On the walk back to GMKS the

kids were full of energy from their success and eager to chant about their skit. The addition of a drum in the skit drew a lot of attention and the funny material kept the audience entertained. In the future it would provide shoppers with sustainable options if the students dispersed their paper bags among the shopkeepers before performing their skit. After a little rest the students went off to collect natural resources (leaves, flowers and dirt) to make paintings with. One painting depicted a cow sitting under a tree, and the others were a collage of flowers, trees and fruits. The students learned that they do not need industrial technology to create art or play games.

After lunch the students went into the forest led by Sundar Arajyak to learn about the Ayurvedic properties of certain plants, for instance: Neem can be used as an antiseptic toothbrush, for blood purification, diabetes, and to treat skin diseases and Adusa can be mixed with warm water and consumed as a juice to treat common colds. This was a great exercise for increasing traditional ecological knowledge, and the students were clearly inspired because they all agreed to use neem sticks instead of going to the market for toothpaste.

On the last day the students left around 9:00 in the morning to visit different sites in Udaipur. At Kanpur/Madri, an industrial area in Udaipur, the students saw brick factories and all of the pollution that is created in irresponsible industrial processes. At Suraj Pol and Delhi Gate, two incredibly busy intersections, the students saw the amount of pollution produced by vehicles. At Titardie, one of Udaipur's waste dumps, the students saw people with diseases living in piles of garbage, cows eating plastic bags and animals decomposing on top of all of the urban waste, the smell was so foul that they only stayed for five minutes. At Gulab Bhag, Udaipur's garden, breathing fresh air and seeing trees relieved the students. Here they agreed that they really do have a wonderful life in the village, with clean air and a plethora of natural resources.

The "Environmental Education Curriculum Winter Camp" was an informative pilot for

the "Mangra" curriculum. A lot of small adjustments can be made by curriculum leaders to the activities in the "Mangra" curriculum to increase physical involvement and encourage creative attitudes. It was also valuable to recognize the importance of warm up games for students to feel willing to participate in some of the activities. The curriculum leaves room for adjustments like these as the leaders feel necessary or as the energy of the group requires.

In addition to these small changes, when I return to Washington I plan to talk to the Hindi department at the University of Washington. The students in Ogna already have English pen pals in Sweden and sponsor program pen pals, and they really enjoy this aspect of GMKS' child development initiatives. I want to provide the students learning Hindi in the United States an opportunity to practice informal communication by writing letters to students in Ogna and give the students in Ogna an outlet to share their environmental ideas and concerns in a language they are proficient with. Hopefully this will give UW students' ideas to think about and a place to practice their Hindi in India and Ogna students an opportunity to learn about environmental discourses in the United States.

For the future of Ogna, the goal of this course is to provide older students with the resources to teach younger children and older community members about environmental sustainability. A major idea in the interviews was that people listen to messages from children. Also, these children are the future of Ogna, by increasing their environmental awareness and literacy the curriculum increases the potential for a healthy environment in Ogna's future. Students will gain more understanding of the local TEKW and about modern sustainable ideas. This knowledge proliferation should create a form of local environmental literacy and should encourage sustainable development in whatever direction is desired by Ogna's tribal communities.

Idea Dispersal

The social, economic and ecological aspects of every community are discourses that dictate the success of any development trend. In a country with so many developing communities it is imperative that the children are provided with an education that encourages sustainable development. This song about Nayam Raj, a god who represents the prowess of the natural environment, written by Dambu Praska of the Dongaria Kondh people illuminates the importance of environmental awareness for India's future:

> He created fruit in the hills,
> grains in the plains.
> He is the first of the Dongaria Kondh.
> After making pineapple, mango, jackfruit and grains,
> Niyam raja said to us
> "Live on what I have given you."
> Niyam Raja is crying today;
> the hills will turn into mud,
> the rocks will crumble and everyone will die.
> Will there be any rivers left if there are no streams?
> Will there be any streams left if there are no hills?
> What will we do without the fruits, grains and buffaloes?
> What will we do without the Niyam Raja?
> What will the animals do without the big forests?
> What will we do without the plants that save lives?[60]

With so many tribal people in India utilizing traditional ecological knowledge and wisdom and so many villages surrounded by plenty of natural resources, it is only logical that children inherit local forms of environmental appreciation. Children in government schools, private schools, urban schools and village schools can all benefit from a holistic, tailored environmental education curriculum. The "Mangra" curriculum is a foundation curriculum, tailored for Ogna's communities, but any of the lessons could be adjusted to suit the interests or local resources of

[60] Living Farms. 2009. Saying No to Mining: Endangered Tribals up against the terror of Vedanta. Seedling, July.

other Indian communities. The lessons cover local ecology, sustainable agriculture, community health, global warming, industry, and sustainable development in an attempt to combine traditional ideas and modern ideas about environmental importance. The natural environment is the foundation for every variation on development; local resources and talents are the catalysts. Knowledge of the ideas and resources that encourage appreciation of sustainable environmental, social and economic structures will benefit the education systems established in developing areas. The children will determine the future of India; the questions that are asked of them and the information they are provided with, are their tools for protection, growth and change.

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Ideas for Further Study

-TEKW or Ayurveda in an environmentally aware village

-Conflicting interests: desire for city living and pride in home village

-Gender roles in village schools

-The effect of an environmental education curriculum designed by an outsider

-Ecotourism as a method of sustainable development

-The influence of "western" pen pals on children in a developing region

-Government environmental education programs

-GMKS' children's initiatives- "Avarwal Children's Forum" (composed of self-help groups from all over Ogna) and the child's day celebration