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Hastening Adoption of Zone-Tillage on CT/ New England Vegetable Farms

Summary/Abstract

The extensive tillage practices used on vegetable farms in the Northeast are expensive and result in problems with soil compaction, soil degradation and soil erosion. Our conventional and IPM vegetable growers continue to compact their soils, break down the soil structure and mine the soil organic matter away every time they till the soil. Most farmers plow, harrow several times, cultipack or bed the plantings, and may also cultivate multiple times.

Multiple tillage trips across the field are expensive and produce plow and disc-pans which often prevents root growth beyond 8-12 inches deep and leads to soil flooding and disease problems. Constant tillage also oxidizes soil organic matter resulting in the loss of soil structure and the inability of the soil to hold water, nutrients and pesticides, which may end up in surface or ground water. With bare-ground production, more organic matter is lost than can be replaced through the use of winter cover crops and by incorporating crop residue. Loss of organic matter can also cause the soil on the surface to plate, making an almost impenetrable barrier, which prevents seed emergence and leads to water pooling. As the farms are divided and handed down to new generations, new growers are pushed off the bottom land and onto the slopes, where they continue to use bare-cultivation

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practices that result in severe soil loss. In 2006, one grower actually resorted to building rock "bridges" every 100 yards or so, across four-foot-deep erosion ditches, so that he could spray his sweet corn for insect pests, and then, rebuilt them when they washed out. As land trusts buy up open land in CT, they often institute policies that prevent farmers from using excessive tillage to prevent further damage to the property. Such policies limit future vegetable production in a state where land is so expensive. As urbanization spreads across New England, farmers also have trouble with new neighbors along the farm boundaries who object to the dust and noise. Fuel prices continue to rise making multiple tillage trips cost prohibitive. Vegetable farmers in an increasingly- crowded region can no longer afford to farm using the same techniques that their father's used. They must adopt reduced-tillage systems that are capable of addressing all these problems or become extinct in New England.

Objectives/Performance Targets

Deep zone tillage/strip tillage/vertical tillage systems can address all of the problems mentioned above and more. Unlike no-till, which relies on a heavy blanket of plant residue to protect the soil and delays the warming of the soil nd crop growth in Northern climates, zone tillage uses a 5-inch-wide tilled trip to simultaneously break up plow pans, warm the soil and prepare a seedbed. A deep shank or subsoiler breaks up the plow-pan while fluted

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coulters cut a strip in the residue/cover crop, and rolling baskets helps break up clods to prepare the narrow seedbed. Most of the ground between the crop rows retain the heavy residue and is protected. The 5-inch-wide tilled strip is slightly raised, warms faster than covered soils, and does not allow water to build up enough speed to erode a slope.

When combined with the use of cover crops, the constant accumulation of organic matter using this system reverses the deterioration of the soil, improves soil drainage, increases soil water and nutrient holding capacity, and allows beneficial soil organisms to thrive. A grower that switched to zone tillage this year in CT, reduced dust problems when preparing fields near a crowded neighborhood, preserved soil moisture which allowed his sequential plantings to go in on time, had better plant stands than his bare-ground fields, prevented dry tips on his sweet corn, and acquired new rental land from a land trust that doesn't permit bare-cultivation. He also made fewer trips across the field with his tractor, saved on fuel and had his best yields ever, despite a prolonged drought. Although these benefits were not obvious is such a dry year, he also helped reduce his Phytophthora problem by breaking up the plow pan, added to his soil organic matter instead of mining more away, and provided insurance against soil erosion and the necessity of building more "stone bridges," had it been a wet year.

Agricultura Orgánica puede abastecer a la población mundial

ANN ARBOR, Michigan—Un nuevo estudio demuestra que la agricultura orgánica puede rendir hasta tres veces más alimentos que la agricultura convencional, ocupando la misma extensión territorial, lo que niega la suposición largamente aceptada que métodos de agricultura orgánica no pueden producir suficientes alimentos para la población mundial.

Investigadores de la Universidad de Michigan descubrieron que en países desarrollados, el rendimiento era casi igual en campos agrícolas orgánicos y en los convencionales. En países en desarrollo la producción puede doblarse o triplicarse utilizando métodos orgánicos, dice Ivette Perfecto, profesora en la Escuela de Recursos Naturales y Medio Ambiente en la Universidad de Michigan, UM. Catherine Badgley, investigadora del Museo de Paleontología, es coautora del estudio junto a varios estudiantes de posgrado y pregrado de la de la UM.

"Mi esperanza es que enterremos de una vez la idea de que no se puede producir suficientes alimentos con agricultura orgánica", dice Perfecto.

Además de comprobar que la agricultura orgánica produce rendimientos iguales o mayores a la convencional, los autores descubrieron que esas producciones pueden ser logradas utilizando las cantidades disponibles en la naturaleza de fertilizantes orgánicos y sin utlizar más tierra agrícola en la producción.

La idea de realizar una revisión exhaustiva de la información existente sobre rendimientos y disponibilidad de nitrógeno surgió cuando Perfecto y Badgley enseñaban una clase sobre el sistema global de alimentos y hacían una visita a un campo en Sur del estado de Michigan.

"Nos impresionó la cantidad de alimentos que producían los agricultores orgánicos" dice Perfecto. Entonces, las investigadoras reunieron información sobre literatura publicada para investigar las dos críticas más importantes a la agricultura orgánica: Su bajo rendimiento y una falta de fuentes de nitrógeno orgánicamente aceptables.

Sus descubrimientos refutan esos argumentos claves, dice Perfecto y confirmó que la agricultura orgánica es menos dañina al medio ambiente, sin embargo potencialmente puede producir más alimentos que los necesarios. Estas son noticias especialmente buenas para los países en desarrollo, donde a veces es imposible suministrar alimentos desde afuera, por lo que los campesinos suministran de las propias cosechas. Los rendimientos en los países en desarrollo podrían aumentar dramáticamente si se cambiara a agricultura orgánica, dice Perfecto.

Aunque parezca extraño, sería razonable, porque en países en desarrollo numerosos campesinos aún no tienen acceso a fertilizantes y pesticidas caros que los agricultores usan en países desarrollados para lograr rendimientos altos.

Tras comparar rendimientos en campos orgánicos y convencionales, los investigadores evaluaron la disponibilidad de nitrógeno. Para hacerlo, multiplicaron el área actual del campo por la cantidad promedio de nitrógeno disponible para la producción de cultivos si el llamado "estiércol verde" era

sembrado entre temporadas de crecimiento. El estiércol verde se utiliza para el cultivo y se mezclan en la tierra para proveer enmiendas naturales al suelo natural, en vez de fertilizantes sintéticos. Los investigadores descubrieron que sembrar estiércol verde entre las temporadas de crecimiento provee suficiente nitrógeno para desarrollar la agricultura orgánica sin fertilizantes sintéticos.

Agricultura orgánica es importante porque la agricultura convencional, que involucra plantas de alto rendimiento, procesos mecanizados, fertilizantes sintéticos y pesticidas, es dañina para el medio ambiente, dice Perfecto. Por ejemplo los residuos de fertilizantes de agricultura convencional son los responsables de las "zonas muertas" en el mar, áreas de bajo oxígeno en las que la vida marina no puede sobrevivir. Los defensores de agricultura orgánica argumentan que la agricultura convencional también causa erosión, emisiones de gases y producen el efecto invernadero, aumento en la resistencia a pestes y pérdida de biodiversidad.

Para su análisis, los investigadores definieron el término orgánico como: Prácticas sostenibles o ecológicas, que utilizan procesos cíclicos de nutrientes no sintéticos, que excluyen o utilizan raramente pesticidas sintéticos, que sostienen y regeneran la calidad del suelo.

Perfecto dice que la idea que la población del mundo padecería de hambre si la agricultura se transformara en orgánica es "ridícula".

"El interés de las corporaciones en la agricultura y la manera en que se realiza la investigación sobre agricultura ha tenido subsidios e influencia de compañías químicas, de pesticidas y de fertilizantes y

todas han tenido un papel importante en convencer al público que necesita tener esas intervenciones para producir alimentos", dice.

El poder de la comunidad: Cómo Cuba sobrevivió al “peak oil”

Read this article in: English

Por Megan Quinn
De Activistas Permacultores
Traducido para Global Public Media por Melisa Chavez Moreno

Habana, Cuba — En el Organipónico de Alamar, un proyecto vecinal de agricultura, un colectivo de trabajadores se encarga de una granja urbana, un mercado de productos y un restaurante. Herramientas manuales y trabajo humano sustituyen a la maquinaria alimentada por combustible. La irrigación por goteo conserva el agua y la variedad de colores de los productos provee a la comunidad de un arco iris de alimentos saludables.

***Granjeros del Organipónico de Alamar, un proyecto de agricultura vecinal en el centro de la Habana arrancan las malas hierbas de sus cultivos. (Foto de John Morgan)*.**

En otros barrios de la Habana que no tienen suficiente tierra para proyectos tan grandes, los residentes han instalado parcelas suspendidas en estacionamientos y han creado huertos en sus patios y azoteas.

Desde principios de los años 90, un movimiento agricultor se ha difundido en Cuba, colocando a su capital de 2.2 millones de habitantes en el camino hacia la sustentabilidad. Un pequeño grupo de australianos ayudaron a este esfuerzo popular, viniendo a este país caribeño en 1993 a enseñar permacultura, un sistema basado en agricultura sustentable que usa mucho menos energía que la común.

Esta necesidad de traer la agricultura a la ciudad empezó con la caída de la Unión Soviética; Cuba perdió más del 50 por ciento de sus importaciones de petróleo, gran parte de sus alimentos y el 85 por ciento de su economía de comercio. El transporte paró, se agudizó el hambre y el habitante cubano promedio perdió 30 libras.

"En realidad, cuando todo esto empezó era una necesidad. La gente tuvo que comenzar a cultivar verduras donde podía", dijo un guía de turistas a un equipo de documentalistas que filmó en 2004 como Cuba sobrevivió con menos petróleo de lo normal. Los documentalistas incluyeron al staff de "The Community Solution", una organización sin fines de lucro en Yellow Springs Ohio que enseña sobre el "peak oil" – el punto en que la producción mundial de petróleo alcanzará un máximo histórico seguido de un declive irreversible. Algunos analistas creen que esto puede ocurrir en ésta década, haciendo de Cuba un modelo a seguir.

"Queríamos captar el elemento que hay en los cubanos y su cultura que les permitió sobreponerse a esta difícil situación," dijo Pat Murphy, director ejecutivo de Community Solution. "Cuba tiene mucho que mostrar al mundo en cómo sobrellevar la adversidad energética."

La escasez de reservas petroleras no solo han transformado la agricultura cubana. El país ha incursionado en energía renovable a pequeña escala y ha desarrollado un sistema de tránsito de masa ahorrador de energía, manteniendo al mismo tiempo su sistema de salud provisto por el gobierno cuyo enfoque médico preventivo y local mantiene escasos recursos.

En Cuba, el periodo que siguió al colapso soviético es conocido como el Periodo Especial. El país perdió 80 por ciento de su mercado de exportación y sus importaciones cayeron en otro 80 por ciento. El producto interno bruto se desplomó en más de un tercio. "Imagina que un avión pierde su motor repentinamente. En realidad fue un choque" dijo Jorge Mario, un economista cubano, al equipo documentalista. Un golpe que puso a Cuba en estado de choque. Ocurrían colapsos frecuentes en la planta de energía que funcionaba con petróleo, hasta 16 horas al día. La ingesta calórica de los cubanos cayó un tercio.

De acuerdo con un reporte de la Oxfam, una agencia internacional para el desarrollo, "en las ciudades, los autobuses dejaron de funcionar, los generadores pararon de producir electricidad, las fábricas se volvieron silenciosas como cementerios. Encontrar la forma de obtener el pan para cada día se volvió la prioridad para muchos, si no es que la mayoría de los cubanos."Esto se debió en parte al embargo estadounidense, pero también a la pérdida de un mercado internacional Cuba no pudo obtener suficientes alimentos importados. Además, sin un substituto de agricultura a grande escala basada en combustibles fósiles, la producción agrícola cayó drásticamente.

Entonces los cubanos comenzaron a sembrar productos orgánicos locales fuera de la pura necesidad, desarrollaron bio-pesticidas y bio-fertilizantes como sustitutos de petroquímicos e incorporaron más frutas y verduras a sus dietas. Como no podían llenar los tanques de sus automóviles viejos, caminaron,

usaron bicicletas, manejaron autobuses y usaron carretas. “Hay un infinidad de pequeñas soluciones”, dice Roberto Sánchez de la Fundación para la Naturaleza y Humanidad en Cuba. “Las crisis, cambios o problemas provocan muchas cosas como éstas, las cuales son básicamente adaptativas. Nos estamos adaptando”.

Una nueva revolución agrícola

Los cubanos también están reemplazando su maquinaria por bueyes y su agricultura urbana reduce las distancias para el transporte de alimentos. Alrededor del 50 por ciento de las verduras en la Habana vienen de la ciudad, mientras que en otros pueblos y ciudades cubanas los jardines urbanos producen del 80 al 100 por ciento de lo que necesitan. Al adoptar la jardinería, individuos y organizaciones vecinales tomaron la iniciativa identificando terrenos baldíos en la ciudad, limpiándolos y plantando.

Unos granjeros posan con sus productos en un mercado del centro de la Habana. El gobierno cubano ahora permite la existencia de estos pequeños mercados que proveen a la comunidad con productos frescos durante todo el año. (Foto de John Morgan).

Cuando los permacultores australianos llegaron a Cuba montaron el primer proyecto de demostración de permacultura con un subsidio de $26,000 por parte del gobierno cubano. A partir de esto nació el

proyecto para el centro de demostración de permacultura urbana de la Fundación para la Naturaleza y Humanidad en Habana. “Con esta demostración, la gente vio lo que pueden hacer en sus patios y azoteas”, dijo Carmen López, directora del centro de permacultura urbana, quien permanece parada al centro de su azotea entre parras, macetas y contenedores para composta hechos con llantas. Desde entonces el movimiento se ha expandido rápidamente en los barrios de la Habana. Hasta hoy, el centro de permacultura urbana de López ha capacitado a más de 400 personas y distribuido una publicación mensual llamada “El Permacultor”. “La comunidad no sólo ha aprendido sobre permacultura”, dice López, “también hemos aprendido sobre la comunidad, a ayudar a la gente cuando hay necesidad de hacerlo”.

Un estudiante de permacultura, Nelson Aguila, un ingeniero convertido en granjero, siembra alimentos para su vecindario en la granja improvisada en su azotea. En solo unos cientos de pies cuadrados tiene conejos, gallinas y grandes macetas con plantas. Hay ratones sueltos que se comen las sobras de los conejos y se convierten en importante fuente de proteínas. “Las cosas están cambiando”, dice Sánchez. “Es una economía local. En otros lugares los vecinos no se conocen entre sí, no saben sus nombres. La gente no se saluda, pero eso no pasa aquí”.

Desde el cambio de producción agrícola petroquímica intensiva a la agricultura y jardinería orgánicas Cuba usa 21 veces menos pesticidas que antes del Periodo Especial. Esto gracias a la producción a gran escala de bio-pesticidas y bio-fertilizantes, los cuales han sido exportados a otros países latinoamericanos.

A pesar de que la transición a la producción orgánica y tracción animal era necesaria, los cubanos están viendo las ventajas. “Un aspecto positivo de la crisis fue volver a usar bueyes,” dice Miguel Coyula, un

especialista en desarrollo comunitario, "no solo nos ahorran combustible, ellos no compactan el suelo de la misma manera que un tractor y los bueyes revuelven la tierra." La "Revolución Verde" agrícola convencional cubana jamás sirvió para alimentar a la población," dice Sánchez. "La producción era grande pero estaba orientada a la agricultura de plantación. Exportábamos cítricos, tabaco, caña de azúcar e importábamos productos básicos. Por lo tanto el sistema, incluso en los buenos tiempos, jamás fue capaz de satisfacer las necesidades básicas de las personas".

Con respecto a la permacultura, Sánchez dijo, "debes seguir los ciclos naturales, por lo que contratas a la naturaleza para trabajar para ti, no contra la naturaleza. Para trabajar contra ella debes desperdiciar enormes cantidades de energía".

Soluciones energéticas

Como la mayor parte de la energía eléctrica en Cuba es generada con petróleo importado la escasez afectó a casi todos en la isla. Apagones fijados varios días a la semana duraron muchos años. Sin refrigeradores la comida se echaba a perder, sin ventiladores el calor era casi insoportable en un país cuya temperatura regular oscila entre los 80 y 90 grados Fahrenheit.

Las soluciones para el problema energético cubano no eran fáciles. Sin dinero, no se podía invertir en energía nuclear, nuevas plantas convencionales de producción de combustible fósil o incluso sistemas de energía eólica y solar a gran escala. En lugar de eso, el país se enfocó en reducir el consumo de energía e implementar proyectos de energía renovables a pequeña escala.

Ecosol Solar y Cuba Solar son dos organizaciones de energía renovable líderes. Ellas ayudan a desarrollar mercados para la energía renovable, vender e instalar sistemas, desarrollar investigación, publicar

boletines y desarrollar estudios de eficiencia energética para usuarios grandes. Ecosol Solar instaló 1.2 megawatts de fotovoltios solares en pequeños sistemas de hogares (con capacidad de 200 watts) y sistemas grandes (con capacidad de 15 a 50 kilowatts). En los Estados Unidos 1.2 megawatts proveen electricidad a 1000 hogares aproximadamente, pero podrían suplir con electricidad a muchos más hogares en Cuba, donde hay pocos aparatos, se acostumbra ahorrar y los hogares son mucho más pequeños.

Alrededor del 60 por ciento de las instalaciones de Ecosol Solar se destinan a programas sociales para dar electricidad a escuelas, centros médicos y centros comunitarios en las áreas rurales. Recientemente instaló paneles fotovoltaicos para electrificar 2,364 escuelas primarias en las zonas rurales donde no era costeable hacerlo. Además, están desarrollando modelos compactos de calentadores de agua solares que pueden ser ensamblados en el campo, bombas de agua que funcionan a base de paneles PV y secadores solares.

Una visita a "Los Tumbos", una comunidad que funciona con energía solar en las áreas rurales del suroeste de la Habana demuestra el impacto positivo de estas estrategias. Sin electricidad, cada hogar tiene un pequeño panel solar que hace funcionar un radio y una lámpara. Sistemas más grandes dan electricidad a la escuela, el hospital y la sala comunitaria, donde los residentes se juntan para ver las noticias de la tarde llamadas "La Mesa Redonda". Además de informar a los residentes, la sala de televisión tiene el beneficio adicional de reunir a la comunidad.

"El sol fue suficiente para mantener con vida a la Tierra durante millones de años," dice Bruno Beres, un directivo de Cuba Solar. "Sólo cuando nosotros [los humanos] llegamos y cambiamos la forma en que

usamos la energía el sol dejó de ser suficiente. Por lo tanto el problema es con nuestra sociedad, no con la energía".

Transporte – Un sistema de compartir vehículos

Los cubanos se encontraron con el problema de tener que proveer transporte en un ambiente de dieta energética. Las soluciones fueron creadas por cubanos ingeniosos que frecuentemente evocan el dicho "la necesidad es la madre de la invención". Con poco dinero ó combustible Cuba mueve masas de personas a horas pico en la Habana. Con una perspectiva inventiva, virtualmente cualquier tipo de vehículo se usó para construir un sistema de tránsito en masa. La gente viaja en carretillas hechas a mano, vehículos jalados por animales, autobuses y cualquier otro transporte motorizado.

Un medio de transporte especial en la Habana, apodado "camello" es un gran semi trailer de metal, jalado con un tractor en el que caben 300 pasajeros. Bicicletas y "cocotaxis" motorizados para dos pasajeros también prevalecen en la Habana, mientras que carretas llevadas por caballos y camiones viejos se usan en pueblos más pequeños.

Este original transporte cubano llamado "camello" tiene capacidad de hasta 300 pasajeros (Foto de John Morgan).

Oficiales del gobierno en uniformes amarillos conducen vehículos del gobierno casi vacíos en las calles de la Habana y los llenan con personas que necesiten un aventón. Chevys de los 50 circulan con cuatro pasajeros adelante y cuatro más atrás. Una carreta jalada por un burro con licencia de taxi también

circula por las calles de Cuba. Muchos camiones fueron convertidos en transporte colectivo adaptándoles escalones en la parte de atrás para que los pasajeros puedan subir y bajar fácilmente.

Educación y salud: Prioridades nacionales.

A pesar de que Cuba es un país pobre con un PIB per capita de sólo $3,000 al año (se ubican en el último tercio de todos los países del mundo), la esperanza de vida es igual a los Estados Unidos y la mortalidad infantil es menos que en EU. La tasa de alfabetización es de 97 por ciento al igual que en EU y los sistemas de salud y educación cubanos son gratuitos.

Cuando los cubanos sufrieron su propia crisis de "peak oil" mantuvieron su sistema de atención médica gratuita, uno de los factores más importantes que les permitió sobrevivir. Los cubanos enfatizan en repetidas ocasiones lo orgullosos que están de su sistema. Antes de la Revolución Cubana de 1959 había un doctor por cada dos mil personas, actualmente hay uno por cada ciento sesenta y siete. Cuba también tiene una escuela de medicina internacional y prepara a doctores para trabajar en otros países pobres. Cada año se envían veinte mil doctores a trabajar en el exterior a hacer este tipo de labores.

Siendo la carne fresca escasa y los vegetales locales abundantes desde 1955, los cubanos actualmente llevan una dieta saludable, baja en grasas y casi vegetariana. También tienen un estilo de vida más saludable con muchas actividades en el exterior, donde caminar y andar en bicicleta son mucho más comunes. "Antes, los cubanos no comían muchos vegetales. Arroz, cerdo y frijoles eran la base de su dieta", dijo Sánchez de la Fundación para la Naturaleza y Humanidad. "En cierto momento la necesidad les enseñó, ahora ellos los exigen [vegetales]".

Los doctores y enfermeras viven en la comunidad donde trabajan y normalmente arriba de las mismas clínicas. En áreas rurales remotas se construyen edificios de tres pisos, con el consultorio del doctor en la planta baja y dos departamentos en los siguientes dos pisos, uno para el doctor y otro para la enfermera. En las ciudades, los doctores y enfermeras siempre viven en los barrios donde trabajan, conocen a las familias de sus pacientes e intentan atender a la gente en sus casas. "La medicina es una vocación, no un trabajo", exclamó una doctora de la Habana demostrando su motivación por lo que hace. En Cuba el 60 por ciento de los doctores son mujeres.

La educación es considerada la actividad social más importante en Cuba. Antes de la revolución había un maestro por cada tres mil personas; hoy en día hay uno por cada cuarenta y dos personas, con una proporción de un maestro por cada dieciséis alumnos. Cuba tiene un porcentaje de profesionales más alto que la mayoría de los países en vías de desarrollo y siendo el 2 por ciento de la población de Latinoamérica tiene el 11 por ciento de todos los científicos.

En un esfuerzo por parar la migración del campo a la ciudad durante el Periodo Especial, la educación superior fue expandida hacia las provincias, ampliando las oportunidades de aprendizaje y fortaleciendo las comunidades rurales. Antes del Periodo Especial solo habían tres instituciones de educación superior en Cuba. Actualmente hay 50 universidades en todo el país, de las cuales siete se encuentran en la Habana.

El poder de la comunidad

A través de sus viajes, el equipo de documentalistas vio y vivió la determinación, habilidad y optimismo de los cubanos, escuchando con frecuencia la frase "sí se puede". La gente hablaba del valor de la

resistencia, demostrando su determinación para vencer los obstáculos; ellos han vivido un embargo económico estadounidense desde principios de los 60 lo cual es visto como uno de los más importantes retos que Cuba ha tenido que resistir.

Hay mucho por aprender de la respuesta cubana hacia la pérdida de petróleo abundante y barato. El equipo de Community Solution ve estas lecciones especialmente importantes para personas de países en vías de desarrollo, que conforman el 82 por ciento de la población mundial y viven en situaciones difíciles. Sin embargo, los países desarrollados también son vulnerables a la escasez de energía y con el advenimiento del "peak oil", todos los países tendrán que adaptarse a la realidad de un mundo con menos energía.

Frente a esta nueva realidad, el gobierno cubano cambió su lema de acción de "socialismo hasta la muerte" a "un mundo mejor es posible". Los oficiales de gobierno permitieron que algunas cooperativas agrícolas y organizaciones vecinales usaran tierras públicas para cultivar y vender sus productos. El gobierno llevó los procesos de toma de decisiones al nivel de la gente común y estimuló iniciativas en sus barrios. También crearon más provincias, alentaron la migración hacia las granjas y áreas rurales y reorganizaron sus provincias para que se alinearan con sus necesidades agrícolas.

(Foto de John Morgan)

Desde el punto de vista de Community Solution, Cuba hizo lo que pudo para sobrevivir a pesar de su ideología de economía centralizada. De cara al cenit y posterior declive en la producción de petróleo ¿Harán los Estados Unidos lo necesario para sobrevivir a pesar de su ideología individualista y

consumista? ¿Se unirán los estadounidenses en comunidad como los cubanos, en espíritu de sacrificio y ayuda mutua?

"Está el cambio climático, el precio del petróleo, la crisis energética…" dijo Beres de Cuba Solar, enlistando los retos que enfrenta la humanidad. "Lo que debemos saber es que el mundo está cambiando y debemos cambiar la manera en que vemos al mundo".

Este artículo apareció en el número especial sobre "Peak Oil" de Permaculture Activist, Primavera 2006. La autora, Megan Quinn, es directora de servicio comunitario en el exterior de The Community Solution, un programa de Community Service Inc., organización sin fines de lucro en Yellow Springs Ohio. Para obtener información sobre éste documental a punto de estrenarse llamado "El poder de la comunidad: Como Cuba sobrevivió al "peak oil" visita su sitio web, escribe a megan@communitysolution.org o llama al 937 767 2161.

Cuba's urban farming program a stunning success

By NIKO PRICE, Associated Press Writer Sun Jun 8, 12:45 PM ET

For Miladis Bouza, the global food crisis arrived two decades ago. Now, her efforts to climb out of it could serve as a model for people around the world struggling to feed their families.

Bouza was a research biologist, living a solidly middle-class existence, when the collapse of the Soviet Union — and the halt of its subsidized food shipments to Cuba — effectively cut her government salary to $3 a month. Suddenly, a trip to the grocery store was out of reach.

So she quit her job, and under a program championed by then-Defense Minister Raul Castro, asked the government for the right to farm an overgrown, half-acre lot near her Havana home. Now, her husband tends rows of tomatoes, sweet potatoes and spinach, while Bouza, 48, sells the produce at a stall on a busy street.

Neighbors are happy with cheap vegetables fresh from the field. Bouza never lacks for fresh produce, and she pulls in between $100 to $250 a month — many times the average government salary of $19.

"All that money is mine," she said. "The only thing I have to buy is protein" — meat.

Cuba's urban farming program has been a stunning, and surprising, success. The farms, many of them on tiny plots like Bouza's, now supply much of Cuba's vegetables. They also provide 350,000 jobs nationwide with relatively high pay and have transformed eating habits in a nation accustomed to a less-than-ideal diet of rice and beans and canned goods from Eastern Europe.

From 1989-93, Cubans went from eating an average of 3,004 calories a day to only 2,323, according to the U.N. Food and Agriculture Organization, as shelves emptied of the Soviet goods that made up two-thirds of Cuba's food. Today, they eat 3,547 calories a day — more than what the U.S. government recommends for American citizens.

"It's a really interesting model looking at what's possible in a nation that's 80 percent urban," said Catherine Murphy, a California sociologist who spent a decade studying farms in Havana. "It shows that cities can produce huge amounts of their own food, and you get all kinds of social and ecological benefits."

Of course, urban farms might not be such a success in a healthy, competitive economy.

As it is, productivity is low at Cuba's large, state-run farms where workers lack incentives. Government-supplied rations — mostly imported from the U.S. — provide such staples as rice, beans and cooking oil, but not fresh produce. Importers bring in only what central planners want, so the market doesn't correct

for gaps. And since most land is owned by the state, developers are not competing for the vacant lots that can become plots for vegetables.

Still, experts say the basic idea behind urban farming has a lot of promise.

"It's land that otherwise would be sitting idle. It requires little or no transportation to get (produce) to market," said Bill Messina, an agricultural economist at the University of Florida in Gainesville. "It's good anyway you look at it."

And with fuel prices and food shortages causing unrest and hunger across the world, many say the Cuban model should spread.

"There are certain issues where we think Cuba has a lot to teach the world. Urban agriculture is one of them," said Beat Schmid, coordinator of Cuba programs for the charity Oxfam International.

Other countries have experimented with urban farming — Cuba's initial steps were modeled after a green belt surrounding Shanghai. But nowhere has urban farming been used so widely to transform the way a country feeds itself.

"As the global food crisis receives attention, this is something that we need to be looking at," Murphy said. "Havana is an unlikely, really successful model where no one would expect one to come from."

Now that Raul Castro is president, many expect him to expand the program he began as an experiment in the early 1990s.

One of the first plots he opened was the "organoponico" on Fifth Avenue and 44th Street in the ritzy Havana neighborhood of Miramar. The half-block farm — owned by a government agency — is surrounded by apartment buildings and houses, but also offices of foreign companies, a Spanish bank and the South African Embassy.

Long troughs brim with arugula, spinach, radishes and basil, and few of the 20,000 square feet are wasted.

One technician tends compost that serves as natural fertilizer, while another handles natural protection from pests, surrounding delicate spinach shoots with strong-smelling celery to ward off insects. Such measures have ecological benefits but were born of necessity: Neither commercial fertilizer nor herbicide is reliably available.

Three workers tend the crops and another three sell them from a brightly painted stall.

Key to the operation is something once unheard of in Cuba: 80 percent of the profits go straight to the workers' pockets, providing them an average of $71 a month.

"Those salaries are higher than doctors, than lawyers," said Roberto Perez, the 58-year-old agronomist who runs the farm. "The more they produce, the more they make. That's fundamental to get high productivity."

Customers say the farm has given them not only access to affordable food, but also a radical change in their cuisine.

"Nobody used to eat vegetables," said David Leon, 50, buying two pounds of Swiss chard. "People's nutrition has improved a lot. It's a lot healthier. And it tastes good."

Ecological farms: the only real way to feed an increasingly hungry world 6
http://www.grist.org/article/2009-11-20-ecological-farms-feed-world
20 Nov 2009

There are those who would like us to believe that industrialized farming is the only way to feed the earth's growing population. Disinformation comes daily from powerful industrial agricultural companies whose profits depend entirely on the sale of chemicals, genetically modified (GM) seeds, and food processing. Furthermore, they maintain that massive-scale farming methods are key to adapting to climate change.

This is just not so.

Contrary to what the propaganda tells us, yields from industrial crops do not consistently produce more food. It's an industry-generated myth that ecologically-safe organic agriculture yields less than conventional agriculture. In fact, a comprehensive study comparing 293 crops from industrial and organic growers demonstrates that organic farm yields are roughly comparable to industrial farms in developed countries; and result in much higher yields in the developing world.

Numerous studies unequivocally state that our survival depends on resilient and

biodiverse farm systems that are free of fossil fuel and chemical dependencies. The 2008 World Bank and United Nations International Assessment on Knowledge, Science and Technology concluded that a fundamental overhaul of the current food and farming system is needed to get us out of both the food and fuel crises. The report's findings indicated that small-scale farmers and agro-ecological methods are the way forward.

This assessment dovetails with a 2002 United Nations Food and Agriculture Organization (FAO) report, which found that organic farming enables ecosystems to better adjust to the effects of climate change and has major potential for reducing agricultural GHG emissions. The FAO report also found that organic agriculture performs better than conventional agriculture in terms of both direct energy consumption (fuel and oil) and indirect consumption (synthetic fertilizers and pesticides).

Large-scale agriculture-dependent upon commercial seeds (including GM seeds), chemical sprays, and petroleum-based fertilizers-can only reliably feed one thing: company profits. These profits come at the expense of our climate as well as farmers who become wholly dependent upon these companies for their livelihood.

And it's farmers who are realizing through hard experience that this system doesn't work. Monsanto, a major proponent of GM seeds, agro-chemicals and industrialized

methods, this week reports a massive $283 billion loss in the third quarter-quite a hit.

Monsanto and others in the industry are scrambling for a foothold in developing nations to save a failed agricultural and business model in the U.S. They're trying to convince foundations, aid agencies, and foreign governments that they hold the only key to staving off starvation. And, the way to do this is by smearing organic farming - which is the only truly dependable way to feed the world - and by ignoring climate change.

They're putting their shareholders' bottom line before a sick and hungry planet. It's time we held them to the truth.

Debbie Barker served as the co-director of the International Forum on Globalization (IFG), a think tank that analyzes and critiques forms of economic globalization, from 1996 to 2008. She is the author of The Predictable Rise and Fall of Global Industrial Agriculture, co-author of The Manifesto on Climate Change and the Future of Food Security (2008), and served on the international committee of authors for the International Assessment of Agricultural Science and Technology for Development (IAASTD).

FAO Promotes Organic Agriculture

FAO Report says organic farming fights hunger, tackles climate change, good for farmers, consumers and the environment. **Sam Burcher**

FAO favours organic agriculture

The United Nations Food and Agricultural Organisation (FAO) has come out in favour of organic agriculture. Its report *Organic Agriculture and Food Security* explicitly states that organic agriculture can address local and global food security challenges [1]. Organic farming is no longer to be considered a niche market within developed countries, but a vibrant commercial agricultural system practised in 120 countries, covering 31 million hectares (ha) of cultivated land plus 62 million ha of certified wild harvested areas. The organic market was worth US$40 billion in 2006, and expected to reach US$70 billion by 2012.

Nadia Scialabba, an FAO official, defined organic agriculture as: "A holistic production management system that avoids the use of synthetic fertilizers and pesticides, and genetically modified organisms, minimizes pollution of air, soil and water, and optimises the health and productivity of plants, animals and people." The strongest benefits of organic agriculture, Scialabba said, are its reliance on fossil fuel independent, locally available resources that incur minimal agroecological stresses and are cost effective. She described organic agriculture as a "neo-traditional food system" which combines modern science and indigenous knowledge.

The FAO Report strongly suggests that a worldwide shift to organic agriculture can fight world hunger and at the same time tackle climate change. According to FAO's previous *World Food Summit report* [2],

conventional agriculture, together with deforestation and rangeland burning, are responsible for 30 percent of the CO2 and 90 percent of nitrous oxide emissions worldwide.

Organic agriculture overcomes paradox of conventional food production systems The new FAO Report frames a paradox within the conventional food production systems as follows: Global food supply is sufficient, but 850 million are undernourished and go hungry
Use of chemical agricultural inputs is increasing; yet grain productivity is dwindling to seriously low levels
Costs of agricultural inputs are rising, but commodity costs have been in steady decline over the past five decades.
Knowledge is increasingly provided through fast information technologies, but nutritionally related diseases are rising
Industrialised food systems cause deaths through pesticide poisonings

and high numbers of farmer have committed suicides, while millions of jobs have been lost in rural areas.
In contrast, organic agriculture offers an alternative food system that improves agricultural performance to better provide access to food, nutritional adequacy, environmental quality, economic efficiency, and social equity. This

is crucial if agricultural production in developing countries is to rise by 56 percent by 2030 to meet nutritional needs, as stated in the Report. Researchers recommend a shift to organic agriculture especially for poor developing countries.

Evidence presented to the FAO by the Danish Research Centre for Food and Farming confirm the potential of a new organic farming paradigm to secure more than enough food to feed the world, and with reduced environmental impacts [3]. The results, using a computer model developed by the Washington DC based Food Policy Research Institute (IFPRI), show that a fifty percent conversion to organic farming in sub-Saharan Africa would not harm food security. Instead, it would help feed the hungry by reducing the need to import subsidised food, and produce a diverse range of certified organic surpluses to be exported at premium profit. The conversion of global agriculture to organic farming, without converting wild lands for agricultures and using N-fertilizers, would result in a global agricultural supply of 2 640 to 4 380 kcal/day/person. These conclusions came from a research team led by Catherine Badgley at the University of Michigan [4], based on extensive review of the evidence from both the developed and developing world (see Scientists Find Organic Agriculture Can Feed the World and More, *SiS* 36 [5]).

The fact that sustainable intensification of organic agriculture could increase production by up to 56 percent is good news, as despite gains in food production and food security in some countries, sub-Saharan Africa produces less food per person than it did 30 years ago; and the number of chronically

malnourished people in the region has doubled since 1970, from 96 million to over 200 million in 1996 [2]. This reflects the wider picture that developing countries have registered outright declinees in yield increases under conventional agriculture between 1972-1992.

In contrast, the current FAO Report presents evidence that organic management systems have doubled yields in arid and degraded soils in Tigray, Ethiopia. (See The Tigray Project [6] and Organic Production for Ethiopia [7], *SiS* 23).

Alexander Mueller, the FAO assistant director-general praised the research, and noted that as the effects of climate change are expected to hurt the world's poorest, a shift to organic farming could be beneficial to cope with the rising number of global hungry. Recommendations arising from the FAO report feed directly into the framework for the Right to Adequate Food and also into the Millenium Development Goal (MDG)1 for reducing hunger and poverty, MDG7 for environmental sustainability, and MDG 8 for global partnerships with emphasis on hidden, acute or chronic hunger. Environmental and economic benefits of organic agriculture FAO Promotes Organic Agriculture Page 2 of 6 http://www.i-is.org.uk/full/FAOPromotesOrganicAgricultureFull.php?printing=yes 11/09/2007

The Danish researchers [3] suggest that a 50 percent organic conversion by 2020 in the food exporting regions of North America and Europe would have little impact on the availability and prices of food. Converting from chemically intensive farming to organic farming can initially decrease yields, but the adjustment evens out over time and provides numerous non-material benefits such as land

improvement. The FAO Report points to further benefits such as better animal welfare, wildlife protection, avoidance of GMOs and pesticides, more jobs and less energy used. Results from studies carried out by the US Department of Agriculture [8] support the FAO findings; showing that organic crops are worth more than conventional crops on the market, and on average, farmers could net $50-$60 more per acre by going organic, even with the highest transitional costs.

The expansion and intensification of conventional farming is harmful not only to the environment, but also to the very resources essential to farming. Over the past two decades, some 15 million ha of tropical forests are lost each year to provide land for agriculture, and at a tremendous loss of genetic diversity [2]. During the same period, soil erosion and other forms of land degradation cost the world between 5-7 million ha of farming land every year; a further 1.5 million ha are lost to waterlogging and salination, and an additional 30 million ha damaged.

Organic agriculture has the potential to reverse those trends, and reduce carbon dioxide, nitrous oxide and methane, greenhouse gasses (GHG) that contribute to global warming [1]. Organic agriculture could double soil carbon sequestration in livestock based systems and decrease GHG by 48-60 percent. For example, organic systems have decreased the use of fossil fuels by between 10-70 percent in Europe, and 29-37 percent in the USA. On organic farms, increasing soil organic matter and microbial biomass is a fundamental principle to support agro-ecosystem stability. Mandatory crop rotation, the use of seeds and breeds that are adapted to local conditions, and the regeneration of functional biodiversity all contribute further to ecological balance.

Organic networks meet local food demands and benefits farmers The FAO gives top priorities to agricultural production that targets local food needs in local markets, allowing imports only for items not grown locally, and exporting high value produce. In developing countries, food quantity, quality and availability in urban areas are enriched by organic market gardens where local produce is sold to international markets and domestic supermarkets. This reduces dependence on cheap subsidized imports, which are projected to rise to more than 160 million tonnes by the year 2010. For example, a food network in Argentina that covers 3.5 million people reports 70 percent self-sufficiency in vegetable production through organic urban garden networks. A successful conversion to organic agriculture has occurred in parts of Egypt where scarce or polluted water supplies led to the development of thriving local markets. In China, the awareness of environmental pollution and the FAO Promotes Organic Agriculture Page 3 of 6 http://www.i-is.org.uk/full/FAOPromotesOrganicAgricultureFull.php?printing=yes 11/09/2007

The need for environmental and health protection resulted in organic-managed land rising from 342 000 ha in 2003 to 978 000 ha in 2005, and increasing local farmers incomes nine-fold. Cuba is an inspiring example of how food crises can be averted by drastically reducing chemical inputs and relinquishing dependency on fossil fuels [9]. National food security was maintained with some help from food aid, by re-localizing organic food production, and

ensuring food access through food rationing and social safety nets such as food and nutrition surveillance systems. Furthermore, organic urban gardens create a healthy environment for the inhabitants and supply local restaurants,
markets and shops with nutritious foods.

As organic produce enters the mainstream, consumers are willing to pay higher prices in exchange for truthful labelling and absorb some of the extra costs of organic agriculture. Demand for organic produce has encouraged
countries like Brazil (fast becoming a world leader in organic farming) and India to reconcile their local food demands. The main challenge to international markets is bringing producers together to create value chains of fair trade, informed choice and traceability [1]. And, as Catherine Badgely argues [4], food security depends as much Government policies and market price as it does on yields.

Producing organic food has distinct benefits for farmers too. Farmers' rights to local seeds and varieties are strengthened, knowledge sharing is promoted, incomes are raised, production increased, environmental and health protection is improved, natural resources are conserved and outward rural migration is reversed. As organic farming is highly knowledge intensive, the FAO recognises that the organization of organic farmers and growers associations, co-operatives, enterprises, and community groups is crucial to research and development. Farmers converting to organic methods also increase incomes by minimizing chemical inputs and other industrial interventions and thereby break the cycle of indebtedness that has devastated hundreds of thousands of farmers livelihoods (See Stem Farmers' Suicides with Organic Farming, [10], *SiS* 32). Ensuring farmers well-being and increasing national and regional self reliance in food production methods that meet key environmental and animal

welfare standards will not only enhance food security, but will also reduce the use of fossil fuel use for food transportation and production. (See Food Miles and Sustainability, [11] *SiS* 28)

Health benefits of organic agriculture

As the FAO Report points out, organic foods tend to have higher micronutrient content that contributes to better health, lower incidence of non-communicable diseases and boosts plant and animal immunity against disease (See Organic Farms Make Healthy Plants Make Healthy People, [12] Organic Strawberries Stop Cancer Cells, [13], *SiS*32). The UK Soil Association carried out a systematic review of the evidence comparing trace minerals in organic and non-organic food, and found that on average, organic food contains higher levels of vitamin C and essential minerals such as calcium, magnesium, iron, and chromium [14]. An independent study found higher levels of all 21 nutrients in organic crops, particularly potatoes, cabbage, spinach and lettuce [15]. Evidence suggests that organic crops contain up to fifty percent fewer mycotoxins (toxins produced by fungi) (See Increased Mycotoxins in Organic Produce? [16]), and have a longer shelf life. FAO Promotes Organic Agriculture Page 4 of 6 http://www.i-sis.org.uk/full/FAOPromotesOrganicAgricultureFull.php?printing=yes 11/09/2007

Organic farmers produce good food from developing a balanced living soil and using only as a last resort four of the hundreds of pesticides on tap to conventional farmers. Non-organic fruits can be sprayed up to 16 times with

36 different pesticides [17]. In 2003 the UK Food Standards Agency (FSA) conceded that: "…buying organic is a way to reduce the chances of your food containing these pesticides." [18]. Pesticide residues used in conventional

farming such as organophosphates are linked with cancers, foetal abnormalities, chronic fatigue syndrome, and Parkinson's, [19] as well as allergies, especially in children [20], and breast cancer in women [21]. The US Government linked pesticide residues to the top three environmental cancer risks. A study in Seattle [22] found concentrations of pesticide residues 6 times higher in children eating conventionally farmed fruits and vegetables.
The restriction on synthetic inputs by organic farmers prevent pesticide poisonings that cause around 20 000 deaths each year in conventional agricultural practices, (see Picking Cotton Carefully [23]); and stop phosphates and nitrates leaching into drinking water.

Organic agriculture provides long term solutions
The FAO Report concludes that a broad scale shift to organic agriculture can produce enough food on a global per capita basis to feed the world's population over the next 50 years. Workable solutions to pressing problems such as the growth in population and consumption, oil peak, fossil fuel dependence, food transport, and agricultural sector employment are all built in holistically to the organic agriculture paradigm. Therefore, as the myth of "low yield organic agriculture" recedes [24], it is up to the agricultural researchers, officials and Governments to invest in long-term alternative agricultural systems such as green manures that can provide enough biologically fixed nitrogen to replace all the synthetic nitrogen currently used on the planet [4]. Despite scepticism at the potential of organic agriculture to feed the world [25], if conventional farmers adopted only some of its principles such as soil
health and ecology, the results would strongly benefit farmers, consumers and the environment.

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http://climate.weather.com/video/

Organic Farming in a Slum

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http://greendreams.edublogs.org/tag/africas-largest-slum/

'Green farms' out-perform 'Gene farms'

Francis Moore Lappé, author of Diet for a Small Planet and founder of Food First and the Small Planet Institute, is frustrated that the mainstream media continue to beat the drum for pesticides and genetic engineering as the solutions to world hunger. Lappe lambastes the media for ignoring the findings of 400 world experts whose April 2008 United Nations' "Agricultural Assessment" concluded that chemical-free agriculture offers a better path to sustainable farming. PANNA Scientist Marcia Ishii-Eiteman was among the lead authors of the United Nations' report. "On every continent," Lappé writes, "one can find empowered rural communities developing GM-free, agro-ecological farming systems. They're succeeding. The largest overview study, looking at farmers transitioning to sustainable practices in 57 countries, involving almost 13 million small farmers on almost 100 million acres, found after four years that average yields were up 79 percent." In India's Andra Pradesh, "the pesticide capital of the world," insects have become resistant to Monsanto insecticides and GM-cotton. The London Guardian reports nearly 2,000 villages in Andhra Pradesh have adopted Non-Pesticide Management practices, having discovered that NPM "is clearly more profitable, not because yields are higher but because expenditure is so much lower."

http://www.panna.org/files/prettyagroecologicalapproaches.pdf

Greening Ethiopia for Food Security & End to Poverty
A remarkable project reversing the ecological and social damages of the past 100 years that have locked the country in poverty.

The world's largest single study of its kind now shows that composting increases yields two to three-fold and outperforms chemical fertilizers by more than 30 percent
Sue Edwards

Challenges
Ethiopia is a land-locked country in the 'Horn of Africa' to the northeast of the continent. Its topography is very diverse, encompassing mountains over 4 000 m above sea level, high plateaus, deep gorges cut by rivers and arid lowlands including the Dallol Depression, which is 110 m below sea level in the Afar [1].
The South Westerly Monsoon is one of the country's three moisture-bearing wind systems. Originating from the South Atlantic, it brings the greatest amount of moisture during the main rainy season (May/June–September/October). The small rains (February-April/May) originate from the Indian Ocean and feed the southern and eastern highland areas. The third rainfall system also originates from the Indian Ocean, and feeds the southern half of the country any time between October and January, and March to May [2]. The mean annual rainfall is highest (above 2 700 mm) in the southwestern highlands, gradually decreasing to below 100 mm in the eastern lowlands of the Afar. The mean annual temperature ranges from a high of 35 °C in the Afar to 10 °C or lower in the highlands above 2 500 m [1]. From November to January in the highlands above 1 500 m, diurnal temperatures can range between below freezing at night, with frost, to over 25 °C during the day [2].

The country faces a number of environmental challenges resulting directly or indirectly from human activities, exacerbated by rapid population growth (population in 2007 estimated at over 77 million) and the consequent increase in the exploitation of natural resources. Most serious of all is land degradation due to the removal of self-governance from local communities of smallholder farmers, starting around the second half of the nineteenth century. This undermined the traditional systems of land management, as farmers were only able to exercise some control over their land when it was growing a crop. The most visible physical impacts are the formation of gullies eating away the soil, the recovery of vegetation prevented by free-range grazing , a nd the unregulated felling of trees for firewood and other purposes.

The central control of local farming communities continued under the military government (1974-1991) and did nothing to restore the farmers' confidence in controlling their own affairs and investing in their land.

These negative trends are now being reversed through the present government's emphasis on the decentralization of power down to the wereda (district), the lowest level of official government intervention, and their constituent tabias in Tigray (kebeles in the rest of the country). Each wereda is also the seat for a member of parliament in the Federal House of Representatives – the Parliament. Elected officials of the tabia run the day-to-day affairs of the local communities.

Opportunities

Despite Ethiopia's status as one of the least developed countries in the world [8], traditional agricultural production is highly diverse and is the main source of food for the population. Two of the main staple crops, the cereal teff (Eragrostis tef) and the root crop enset (Ensete ventricosa), are endemic, and many of the crops known to have their centres of origin in the fertile crescent of south-west Asia, for

example durum wheat (Triticum durum), now have their highest genetic diversity in Ethiopia. Ethiopia is one of the eight major centres for crop diversity in the world [3].

Other important crops with high genetic diversity in Ethiopia include the cereals—barley (Hordeum vulgare), finger millet (Eleusine coracana) and sorghum (Sorghum bicolour); pulses—faba bean (Vicia faba), field pea (Pisum sativum including the endemic var. abyssinicum), chick pea (Cicer arietinum) and grass pea (Lathyrus sativus); oil crops—linseed (Linum sativum), niger seed (Guizotia abyssinca), safflower (Carthamus tinctorius) and sesame (Sesamum indicum); and root crops—anchote (Coccinia abyssinica), 'Oromo or Wollaita dinich' (Plectranthus edulis), and yams (Dioscorea spp.). Over 100 plant species used as crops have been identified in Ehtiopia. [4]

Agriculture accounts for more than 75 percent of total exports, over 85 percent of employment; and about 45 percent of the GDP (gross domestic product). Coffee alone makes up more than 87 percent of the total agricultural exports. Hides and skins are the next most important export items as raw, processed or manufactured goods. [5]

The Government has stated that Ethiopia's development has to be based on its capacity to produce agricultural products to ensure food security for its population, provide the raw materials for agro-industrial development and earn foreign exchange. This is set out in "Ethiopia: Building on Progress — A Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005/06-2009/10) [6].

Problems of chemical inputs

In 1995, a version of the Green Revolution, called the Sasakawa Global 2000 (SG-2000) programme [7] was introduced by the Ministry of Agriculture to boost food production through a campaign to get smallholder farmers to use chemical fertilizer along with, when possible, high yielding varieties (HYVs) and pesticides. Prior to 1995, Ethiopia had one of the lowest per capita uses of fertilizer in the world [8].

Under SG-2000, farmers were allowed to select the crops they wanted to grow with fertilizer and use the best of their own local varieties rather than buy seed of HYVs; and it is only since 2003 that more widely adapted 'improved seeds' have been promoted and taken up by smallholder farmers. But there are also efforts to promote the conservation and enhancement of farmers' varieties (often called landraces) using organic principles [9].

From 1998, the subsidy on chemical fertilizer was withdrawn and the price had more than doubled by 2007. Access to credit for purchasing fertilizer has continued to be made available to farmers up to the present. By 2001, around 5 percent of the smallholder farmers, particularly those growing maize, had become accustomed to using fertilizer. But that year, the price dropped out of the bottom of the maize market and the farm gate price in some areas fell to the equivalent of US$ 1.50 per 100 kg [9].

In 2002, many farmers were heavily in debt and withdrew from the fertilizer schemes. Many parts of the country were also hit by a much shorter rainy season with the rains stopping early, or by drought. Consequently, yields declined, or crops failed completely and the government requested food aid for more than 14 million people, nearly a quarter of the total population [10].

Greening Ethiopia

The Environmental Policy of Ethiopia, issued in 1997, incorporated a basic principle similar to one adopted in organic agriculture [11]: "Ensure that essential ecological processes and life support systems are sustained, biological diversity is preserved and renewable natural resources are used in such a way that their regenerative and productive capabilities are maintained, and, where possible, enhanced...; where this capacity is already impaired to seek through appropriate interventions a restoration of that capabilit y."

This enabling policy context dovetails with a unique experiment in sustainable development and ecological land management conducted with farmers in Tigray and the birth of an organic agriculture movement in the country as a whole.

In 1995, Dr Tewolde Berhan Gebre Egziabher, founder of the Institute for Sustainable Development (ISD), was asked by some government officials to design a project that could help farmers trying to eke out an existence on the highly degraded land of the highlands. The aim was to help the farmers use an ecological approach with a minimum of external inputs to improve the productivity of their land and rehabilitate their environments. The project started in 1996 as a partnership with the Bureau of Agriculture and Rural Development (BoARD) of Tigray, and is still continuing to be run by the BoARD. The other partners in the project are Mekele University, the local communities and their local administration.

The project focuses on helping local communities restore local control and effective management of their natural resources through the development and enforcement of their own by-laws [12]. Measures used aim at:

Improving biological and physical water and soil conservation in cropland including the control and rehabilitation of gullies

Controlling, preferably stopping, free-range grazing to allow more grass, herbs and trees to grow

Restoring soil fertility by making and using compost, and helping farmers avoid debt through paying for chemical fertilizer

Incorporating grasses and fast growing legumes in areas treated for soil and water conservation.

The most successful measure has been the planting of the small multipurpose indigenous tree, Sesbania sesban , for animal forage and compost biomass on the bunds between fields, and in the rehabilitated gullies, along with grasses, particularly elephant grass. There has also been a rapid re-establishment of

indigenous plants, particularly shrubs and trees, in the gullies and on hillsides protected from grazing animals.

Project activities in four communities were established in 1996/97 and 1997/98. Since 2000, there has been a rapid scaling up of the project so that by 2006, ISD was following up project activities in 57 local communities in 12 of the 53 weredas in Tigray. Much effort has been made to include households headed by women in the project because these are generally among the poorest of the poor in their villages [12].

Since 2000, the BoARD has been promoting the land rehabilitation 'package'—compost, trench bunding for soil and water conservation with planting multipurpose trees and grasses—in over 90 communities within 25 weredas in the drier more degraded areas of the Region. By 2007, an estimated 25 percent of the farming population in Tigray were using this package, particularly making and using compost.

Results of the initial successes were published by the Institute of Science in Society in 2004 [13-15] (Greening Ethiopia , The Tigray Project , and Organic Production for Ethiopia , SiS 23) . The Third World Network (TW N) published a fuller account in 2006 [12]; TWN had funded the project right from the beginning.

Since 2005, the Swedish Society for Nature Conservation (SSNC) has also provided funding to ISD for promoting sustainable agriculture in Tigray, Amhara and Oromiya Regions. This included publishing a poster on making compost to support the compost manual in Tigrinya (the local language of Tigray) in 2002 [16], and distributing these to all 53 weredas of Tigray. In 2007, an Amharic version of the compost manual and poster were prepared for publication as part of the UNDP-funded Land Rehabilitation Project in the Federal Environmental Protection Authority (EPA).

In 2006, the FAO Natural Resources Department provided funding to help collect additional yield data from plots in farmers' fields during the 2006 harvesting season, and pay for the entry and statistical

analysis of the data. The final database included plot yields from 974 farmers' fields and 13 crops taken over the years 2000 to 2006 inclusive [1 7]. The results were presented at the FAO International Conference on " Organic Agriculture and Food Security " held 2-5 May 2007 in FAO, Rome [18]
This is now the single largest study of its kind in the world comparing yields from the application of compost and chemical fertilizer in farmers' fields. The results show without any doubt that compost can replace chemical fertilizers and increase yields by more than 30 percent on average.

Organic composting superior to chemical fertilizers
An important feature of the Tigray Project is that it is largely the farme rs, supported by local wereda-based experts from the BoARD, who have led the project. They choose which crops to treat with compost and which with chemical fertilizer.
The method used to collect the yield data was based on the crop sampling system developed by FAO to estimate a country's potential harvest and identify threats to local food security. Three one-metre square plots were harvested from each field to reflect the range of conditions of the crop. The harvested crop was then threshed and the grain and straw were weighed separately. For comparison, all yields have been converted into kg/ha in the following table.
The fields for taking the yield samples are selected with the farmers to represent the most widely grown crops. There are three treatments. 'Check' means a field that has received neither compost nor chemical fertilizer, although it may have received compost in one or more previous years. 'Compost' is for fields treated with mature compost; the rates of application range from around 5 t/ha in poorly endowed areas, such as the dry Eastern Zone of Tigray, to around 15 t/ha in the moister Southern Zone. 'Fertilizer' is for fields treated with the chemicals DAP (diammonium phosphate) and urea. The recommended rates are 100 kg/ha of DAP and 50 kg/ha of urea.

The original data were collected by community and included 13 crops, but here they have been compiled for the four most widely grown cereals and the most important pulse: barley, wheat, maize, teff, and faba bean. The results of a one-way analysis of variance (ANOVA) are given in Table 11.1, which also shows the 95 percent confidence intervals for the mean.
Table 11.1. Summary of yield data for five main crops

As can be seen, there are large differences between the means of every crop with respect to treatments. Compost gives the highest yields for all crops; typically double those of the 'check', and better than those from chemical fertilizer by an average of 30.1 percent (from 17.8 percent for faba bean to 47.4 percent for wheat).
Pairwise comparisons (not shown) of treatments for all crops are highly significant (at the 0.1 percent level or better), except for compost versus fertilizer in faba beans, where there are too few observations for treatment with fertilizer.

Farmers experience multiple benefits from composting
Farmers who have learnt how to make and use compost based on the method recommended by ISD are not interested in continuing to use chemical fertilizer, i.e. they have willingly withdrawn from the use of chemical fertilize r.
In 1998, the grain yields of all cereals without any inputs (checks), except for maize, were below 1 t/ha: 395-920 kg/ha for barley, 465-750 kg/ha for durum wheat, and 480-790 kg/ha for teff [19]. In the 7-year

data set for the four widely grown cereal crops the average check yields ranged from 1116 kg/ha for barley to 1642 kg/ha for maize.
Soon, farmers began to observe and appreciate the residual effect of compost in maintaining soil fertility for two or more years. They are thus able to rotate the application of compost on their fields and do not have to make enough to apply to all their cultivated land each year.

There were many other positive impacts of composting.
Difficult weeds, such as Ethiopian wild oats Avena vaviloviana , have been reduced, and crops show improved resistance to pests such as teff shoot fly.
Farmers who make and use compost are able to avoid the financial risk of taking chemical fertilizer on credit, and the compost is available when it is needed ; chemical fertilizer is sometimes delivered too late for the farmers to use. The most visible impact of farmers not having to take fertilizer on credit is that they often invest in improving their homes and compounds, for example, replacing thatching with more water-proof corrugated iron sheets, and/or diversifying their production base by keeping beehives.
Composted fields are able to retain more moisture than untreated fields or those treated with chemical fertilizer, so that when there are dry periods, composted crops continue to grow. This was seen dramatically in 2002 when the main rains were very poor and stopped early. Crops in composted fields were still green when those in check and especially chemically fertilized fields had withered and died.
The women say that food made from grain harvested from composted fields have better flavour and provide a more satisfying and sustaining meal for their families than grain from fields treated with chemical fertilizers.
Once farmers appreciate the improved productivity of composting, they usually start to re-establish the diversity of crops, particularly cereals and pulses familiar to them before their land became highly

degraded. One farmer successfully searched far and wide for 'Demehai', a variety of easily de-hulled barley used to make a snack of roasted grain, to reintroduce into his farm once he had become food secure through the use of compost.

Farmers also become innovative in trying out new crops and crop combinations. For example, one farmer in Adi Nifas now regularly plants vegetables, particularly tomato and chilli pepper in his teff field. These do not interfere with the tef, maturing after the grain is harvested and bringing the farmer additional income. Many other farmers have now adopted this and other innovative forms of inter-cropping.

Many farmers have also started to plant fruit trees, both around their homesteads and in rehabilitated gullies. Women farmers are particularly adept at taking care of these fruit trees, such as citron (Citrus medica) and papaya, and they are now also starting to grow mulberry and castor (Ricinus communis) to raise silkworms because there is an emerging market for the silk. ISD, with financial support from SSNC, assisted the local agricultural experts of Tahtai Maichew Wereda near Axum to e stablish a fruit tree nursery to meet the escalating demand for fruit tree seedlings from the farmers.

In Adi Nifas, where the main gullies and hillside were treated with check dams at the start of the project, the streams from the hillside used to dry up quickly in the dry season. Now these streams hold water all year round and the resulting small river has made it possible for several farmers downstream to develop irrigated vegetable production, particularly of onions, after they have harvested their grain crops. These farmers are able to regularly get two crops a year from their land and their land, which used to be considered as being among the worst in that area, is seen as totally rehabilitated and productive.

Organic agriculture for an end to poverty

The use of compost to restore soil fertility can go a long way towards combating poverty and ensuring food security for smallholder farmers who typically cultivate less than one hectare of land. Through indirect discussions, it appears that most of these farming families have at least sufficient food grains stored in their houses to feed their families for the whole year, and some have larger stores. One farmer who generally looked poorly dressed had his house threatened by a flood. He had to call his neighbours to help him and his family move their stored grain to a safe place because he had been able to accumulate enough to maintain his family for about three years!

In 2003, the administration of Tahtai Maichew Wereda, about 25 km west of Axum in northern Tigray, asked ISD, the federal Environmental Protection Authority and the BoARD of Tigray to help it expand the 'Sustainable Agriculture/Development Project' to all tabias in the Wereda, i.e. to over 20,000 households. The project was launched in July 2004 at a workshop involving around 200 women and men farmers, the local administration, all 50 local experts and key representatives from the Regional offices in Mekelle, the Regional capital.

An emerging challenge is the involvement of the local justice system, the 'social courts', to help uphold and enrich local by-laws to back up improvements to land and its management by the local communities.

The experience with the farmers in Tigray in producing and using compost shows that the aim for Ethiopia to have a substantial number of farmers producing organically can be realized. It also shows that the introduction of ecologically sound organic principles can have very rapid positive impacts on the productivity and well-being of smallholder farmers because they do not have to go through a conversion period of reduced yields as they go into using compost. Most farmers, particularly those in marginal areas, are not able to afford external inputs, so for them an organic production management system offers a real and affordable means to break out of poverty and delivering food security.

The organic movement is gathering momentum in Ethiopia and it is unstoppable. An Ethiopian Organic Agriculture System was approved by Parliament on 8 March 2006 [2 0]. The international trade in organic products is an expanding market that Ethiopia is geographically well situated to exploit, not just in the developed economies of Europe, North America and Japan, but also in the Arabian Peninsula and Near East.

Coffee was the first certified organic product exported from Ethiopia. In 1995, the world market price for coffee started to decrease dramatically and it was quickly realised that producers could improve their returns through organic production supported by fair trade. Organic fair trade coffee is increasing its market share by about threefold each year with most of it being exported to the USA. Through these quality certificates, a minimum of 20 per cent is added on top of the local price for farmers. This has changed the livelihood of the farmers and their communities: additional schools have been built as well as health centres and several clean-water delivery points. By 2007, the Oromia Coffee Union, the first and now the largest in the country, was buying coffee from 115 cooperatives. When it started, these were the first organic certified cooperatives in Africa. This Union now sells more than 4 000 tonnes of organic coffee a year obtained from 80 000 ha of organic certified land. [21]

By 2007, there were four international organic inspection and certification bodies in Ethiopia, all with local Ethiopian experts. The certified organic products being exported are all high value products: coffee, honey, sesame, pulses, teff, pineapple, bananas, linseed, spices and herbs from farmers' fields, and incense and myrrh collected from the wild [2 1].

There is also an expanding awareness of the importance of producing healthy fruits and vegetables for the educated middle-class and expatriate market in Addis Ababa. For example, Genesis Farm, started in 2001, now produces high quality organically grown vegetables on an area of 40 ha. The vegetable farm has 302 permanent workers and 52 daily labourers. The farm also has a dairy herd of 110 cows and 50

000 chickens, not totally organic by European standards, but much healthier than most other animal production enterprises of a similar size in Ethiopia. There is a high demand for the products of the farm , which supplies hotels and supermarkets in Addis Ababa, as well as having its own shop on the farm. What is very interesting to note is that the prices of the products in the shop on the farm are generally the same or even somewhat cheaper than their equivalents from non-organic production units around Addis Ababa.

The future looks bright for organic Ethiopia. The rest of the world should take heart and take heed.
Sue Edwards is director of the Institute of Sustainable Development in Addis Ababa, and has been involved in the Tigray Project from its inception

How Cuba Survived Peak Oil

25 Feb 2006
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By Megan Quinn
From Permaculture Activist

Havana, Cuba -- At the Organipónico de Alamar, a neighborhood agriculture project, a workers' collective runs a large urban farm, a produce market and a restaurant. Hand tools and human labor replace oil-driven machinery. Worm cultivation and composting create productive soil. Drip irrigation conserves water, and the diverse, multi-hued produce provides the community with a rainbow of healthy foods.

Farmers at the Organiponico de Alamar, a neighborhood agriculture project in downtown Havana, weed the beds. (Photo by John Morgan)

In other Havana neighborhoods, lacking enough land for such large projects, residents have installed raised garden beds on parking lots and planted vegetable gardens on their patios and rooftops.

Since the early 1990s, an urban agriculture movement has swept through Cuba, putting this capital city of 2.2 million on a path toward sustainability.

A small group of Australians assisted in this grass-roots effort, coming to this Caribbean island nation in 1993 to teach permaculture, a system based on sustainable agriculture which uses far less energy.

This need to bring agriculture into the city began with the fall of the Soviet Union and the loss of more than 50 percent of Cuba's oil imports, much of its food and 85 percent of its trade economy. Transportation halted, people went hungry and the average Cuban lost 30 pounds.

"In reality, when this all began, it was a necessity. People had to start cultivating vegetables wherever they could," a tour guide told a documentary crew filming in Cuba in 2004 to record how Cuba survived on far less oil than usual.

The crew included the staff of The Community Solution, a non-profit organization in Yellow Springs, Ohio which teaches about peak oil – the time when oil production world-wide will reach an all-time high and head into an irreversible decline. Some oil analysts believe this may happen within this decade, making Cuba a role model to follow.

"We wanted to see if we could capture what it is in the Cuban people and the Cuban culture that allowed them to go through this very difficult time," said Pat Murphy, The Community Solution's executive director. "Cuba has a lot to show the world in how to deal with energy adversity."

Scarce petroleum supplies have not only transformed Cuba's agriculture. The nation has also moved toward small-scale renewable energy and developed an energy-saving mass transit system, while

maintaining its government-provided health care system whose preventive, locally-based approach to medicine conserves scarce resources.

The era in Cuba following the Soviet collapse is known to Cubans as the Special Period. Cuba lost 80 percent of its export market and its imports fell by 80 percent. The Gross Domestic Product dropped by more than one third.

"Try to image an airplane suddenly losing its engines. It was really a crash," Jorge Mario, a Cuban economist, told the documentary crew. A crash that put Cuba into a state of shock. There were frequent blackouts in its oil-fed electric power grid, up to 16 hours per day. The average daily caloric intake in Cuba dropped by a third.

According to a report on Cuba from Oxfam, an international development and relief agency, "In the cities, buses stopped running, generators stopped producing electricity, factories became silent as graveyards. Obtaining enough food for the day became the primary activity for many, if not most, Cubans."

In part due to the continuing US embargo, but also because of the loss of a foreign market, Cuba couldn't obtain enough imported food. Furthermore, without a substitute for fossil-fuel based large-scale farming, agricultural production dropped drastically.

So Cubans started to grow local organic produce out of necessity, developed bio-pesticides and bio-fertilizers as petrochemical substitutes, and incorporated more fruits and vegetables into their diets. Since they couldn't fuel their aging cars, they walked, biked, rode buses, and carpooled.

"There are infinite small solutions," said Roberto Sanchez from the Cuban-based Foundation for Nature and Humanity. "Crises or changes or problems can trigger many of these things which are basically adaptive. We are adapting."

A New Agricultural Revolution

Cubans are also replacing petroleum-fed machinery with oxen, and their urban agriculture reduces food transportation distances. Today an estimated 50 percent of Havana's vegetables come from inside the city, while in other Cuban towns and cities urban gardens produce from 80 percent to more than 100 percent of what they need.

In turning to gardening, individuals and neighborhood organizations took the initiative by identifying idle land in the city, cleaning it up, and planting.

Farmers pose with their produce at a farmers' market in downtown Havana. The Cuban government now allows these private markets, which provide year-round fresh local food to the community. (Photo by John Morgan)

When the Australian permaculturists came to Cuba they set up the first permaculture demonstration project with a $26,000 grant from the Cuban government.

Out of this grew the Foundation for Nature and Humanity's urban permaculture demonstration project and center in Havana. "With this demonstration, neighbors began to see the possibilities of what they can do on their rooftops and their patios," said Carmen López, director of the urban permaculture center, as she stood on the center's rooftop amongst grape vines, potted plants, and compost bins made from tires.

Since then the movement has been spreading rapidly across Havana's barrios. So far López' urban permaculture center has trained more than 400 people in the neighborhood in permaculture and distributes a monthly publication, "El Permacultor." "Not only has the community learned about permaculture," according to López, "we have also learned about the community, helping people wherever there is need."

One permaculture student, Nelson Aguila, an engineer-turned-farmer, raises food for the neighborhood on his integrated rooftop farm. On just a few hundred square feet he has rabbits and hens and many large pots of plants. Running free on the floor are gerbils, which eat the waste from the rabbits, and become an important protein source themselves. "Things are changing," Sanchez said. "It's a local economy. In other places people don't know their neighbors. They don't know their names. People don't say 'hello' to each other. Not here."

Since going from petrochemical intensive agricultural production to organic farming and gardening, Cuba now uses 21 times less pesticide than before the Special Period. They have accomplished this with their large-scale production of bio-pesticides and bio-fertilizers, exporting some of it to other Latin American countries.

Though the transition to organic production and animal traction was necessary, the Cubans are now seeing the advantages. "One of the good parts of the crisis was to go back to the oxen," said Miguel Coyula, a community development specialist, "Not only do they save fuel, they do not compact the soil the way the tractor does, and the legs of the oxen churn the earth."

"The Cuban agricultural, conventional, 'Green Revolution' system never was able to feed the people," Sanchez said. "It had high yields, but was oriented to plantation agriculture. We exported citrus, tobacco, sugar cane and we imported the basic things. So the system, even in the good times, never fulfilled people's basic needs."

Drawing on his permaculture knowledge, Sanchez said, "You have to follow the natural cycles, so you hire nature to work for you, not work against nature. To work against nature, you have to waste huge amounts of energy."

Energy Solutions

Because most of Cuba's electricity had been generated from imported oil, the shortages affected nearly everyone on the island. Scheduled rolling blackouts several days per week lasted for many years. Without refrigerators, food would spoil. Without electric fans, the heat was almost unbearable in a country that regularly has temperatures in the 80s and 90s.

The solutions to Cuba's energy problems were not easy. Without money, it couldn't invest in nuclear power and new conventional fossil fuel plants or even large-scale wind and solar energy systems. Instead, the country focused on reducing energy consumption and implementing small-scale renewable energy projects.

Ecosol Solar and Cuba Solar are two renewable energy organizations leading the way. They help develop markets for renewable energy, sell and install systems, perform research, publish newsletters, and do energy efficiency studies for large users.

Ecosol Solar has installed 1.2 megawatts of solar photovoltaic in both small household systems (200 watt capacity) and large systems (15-50 kilowatt capacity). In the United States 1.2 megawatts would provide electricity to about 1000 homes, but can supply power to significantly more houses in Cuba where appliances are few, conservation is the custom, and the homes are much smaller.

About 60 percent of Ecosol Solar's installations go to social programs to power homes, schools, medicals facilities, and community centers in rural Cuba. It recently installed solar photovoltaic panels to electrify 2,364 primary schools throughout rural Cuba where it was not cost effective to take the grid. In addition, it is developing compact model solar water heaters that can be assembled in the field, water pumps powered by PV panels, and solar dryers.

A visit to "Los Tumbos," a solar-powered community in the rural hills southwest of Havana demonstrates the positive impact that these strategies can have. Once without electricity, each household now has a small solar panel that powers a radio and a lamp. Larger systems provide electricity to the school, hospital, and community room, where residents gather to watch the evening news program called the "Round Table." Besides keeping the residents informed, the television room has the added benefit of bringing the community together.

"The sun was enough to maintain life on earth for millions of years," said Bruno Beres, a director of Cuba Solar. "Only when we [humans] arrived and changed the way we use energy was the sun not enough. So the problem is with our society, not with the world of energy."

Transportation - A System of Ride Sharing

Cubans also faced the problem of providing transportation on a reduced energy diet. Solutions came from ingenious Cubans, who often quote the phrase, "Necessity is the mother of invention." With little money or fuel, Cuba now moves masses of people during rush hour in Havana. In an inventive approach, virtually every form of vehicle, large and small, was used to build this mass transit system. Commuters ride in hand-made wheelbarrows, buses, other motorized transport and animal-powered vehicles.

One special Havana transit vehicle, nicknamed a "camel," is a very large metal semi-trailer, pulled by a standard semi-truck tractor, which holds 300 passengers. Bicycles and motorized two-passenger rickshaws are also prevalent in Havana, while horse drawn carts and large old panel trucks are used in the smaller towns.

This unique Cuban transport vehicle, called a "camel", can carry 300 passengers. (Photo by John Morgan)

Government officials in yellow garb pull over nearly empty government vehicles and trucks on Havana's streets and fill them with people needing a ride. Chevys from the 1950s cruise along with four people in front and four more in back.

A donkey cart with a taxi license nailed to the frame also travels Cuba's streets. Many trucks were converted to passenger transport by welding steps to the back so riders could get on and off with ease.

Health Care and Education - National Priorities

Even though Cuba is a poor country, with a per capita Gross Domestic Product of only $3,000 per year (putting them in the bottom third of all nations), life expectancy is the same as in the U.S., and infant mortality is below that in the U.S. The literacy rate in Cuba is 97 percent, the same as in the U.S. Cuba's education system, as well as its medical system is free.

When Cubans suffered through their version of a peak oil crisis, they maintained their free medical system, one of the major factors that helped them to survive. Cubans repeatedly emphasize how proud they are of their system.

Before the Cuban Revolution in 1959, there was one doctor for every 2000 people. Now there is a doctor for every 167 people. Cuba also has an international medical school and trains doctors to work in other poor countries. Each year there are 20,000 Cuban doctors abroad doing this kind of work.

With meat scarce and fresh local vegetables in abundance since 1995, Cubans now eat a healthy, low-fat, nearly vegetarian, diet. They also have a healthier outdoor lifestyle and walking and bicycling have become much more common. "Before, Cubans didn't eat that many vegetables. Rice and beans and pork meat was the basic diet," Sanchez from the Foundation for Nature and Humanity said. "At some point necessity taught them, and now they demand [vegetables]."

Doctors and nurses live in the community where they work and usually above the clinic itself. In remote rural areas, three-story buildings are constructed with the doctor's office on the bottom floor and two apartments on the second and third floors, one for the doctor and one for the nurse.

In the cities, the doctors and nurses always live in the neighborhoods they serve. They know the families of their patients and try to treat people in their homes. "Medicine is a vocation, not a job," exclaimed a Havana doctor, demonstrating the motivation for her work. In Cuba 60 percent of the doctors are women.

Education is considered the most important social activity in Cuba. Before the revolution, there was one teacher for every 3,000 people. Today the ratio is one for every 42 people, with a teacher-student ratio of 1 to 16. Cuba has a higher percentage of professionals than most developing countries, and with 2 percent of the population of Latin America, Cuba has 11 percent of all the scientists.

In an effort to halt migration from the countryside to the city during the Special Period, higher education was spread out into the provinces, expanding learning opportunities and strengthening rural communities. Before the Special Period there were only three institutions of higher learning in Cuba. Now there are 50 colleges and universities throughout the country, seven in Havana.

The Power of Community

Throughout its travels, the documentary crew saw and experienced the resourcefulness, determination, and optimism of the Cuban people, often hearing the phrase "Sí, se puede" or "Yes it can be done."

People spoke of the value of "resistir" or "resistance," showing their determination to overcome obstacles. And they have lived under a U.S. economic blockade since the early 1960s, viewed as the ultimate test of the Cuban ability to resist.

There is much to learn from Cuba's response to the loss of cheap and abundant oil. The staff of The Community Solution sees these lessons as especially important for people in developing countries, who make up 82 percent of the world's population and live more on life's edge. But developed countries are also vulnerable to shortages in energy. And with the coming onset of peak oil, all countries will have to adapt to the reality of a lower energy world.

With this new reality, the Cuban government changed its 30-year motto from "Socialism or Death" to "A Better World is Possible." Government officials allowed private entrepreneurial farmers and neighborhood organizations to use public land to grow and sell their produce. They pushed decision-making down to the grassroots level and encouraged initiatives in their neighborhoods. They created more provinces. They encouraged migration back to the farms and rural areas and reorganized their provinces to be in-line with agricultural needs.

(Photo by John Morgan)

From The Community Solution's viewpoint, Cuba did what it could to survive, despite its ideology of a centralized economy. In the face of peak oil and declining oil production, will America do what it takes to survive, in spite of its ideology of individualism and consumerism? Will Americans come together in community, as Cubans did, in the spirit of sacrifice and mutual support?

"There is climate change, the price of oil, the crisis of energy …" Beres from Cuba Solar said, listing off the challenges humanity faces. "What we must know is that the world is changing and we must change the way we see the world."

This article appeared in the special Peak Oil issue of Permaculture Activist, Spring 2006. The author, Megan Quinn, is the outreach director for The Community Solution, a program of Community Service Inc., a nonprofit organization in Yellow Springs, Ohio. For information about its soon-to-be-released documentary, "The Power of Community: How Cuba Survived Peak Oil" visit its website, e-mail her at megan@communitysolution.org, or call 937-767-2161.

[Livingontheland] How You Can Start a Farm in Heart of the City

Saturday, January 10, 2009
"Tradingpost" <tradingpost@lobo.net>
livingontheland@lists.ibiblio.org

How You Can Start a Farm in Heart of the City
By Kelly Coyne and Erik Knutzen, Process Media. Posted January 9, 2009.
http://www.alternet.org/environment/118483/how_you_can_start_a_farm_in_heart_of_the_city/?page=entire

Sick of flavorless, genetically modified, pesticide-drenched frankenvegetables? It's time to start growing food in your back yard.

The following is an excerpt from The Urban Homestead: Your Guide to Self-sufficient Living in the Heart of the City by Kelly Coyne and Erik Knutzen (Process Self-reliance Series).

Imagine sitting down to a salad of peppery arugula and heirloom tomatoes that you grew yourself. Or a Sunday omelet of eggs laid that morning, served with a thick slice of fresh sourdough, butter and apricot jam -- all homemade, of course. Or imagine toasting your friends with a mead made from local honey. Where would you have to move to live like this? A commune in Vermont? A villa in Italy?

My husband Erik and I have done all of this in our little bungalow in Los Angeles, two blocks off of Sunset

Boulevard. We grow food and preserve it, recycle water, forage the neighborhood, and build community. We're urban homesteaders.

Though we have fantasies about one day moving to the country, the city holds things that are more important to us than any parcel of open land. We have friends and family here, great neighbors, and all the cultural amenities and stimulation of a city. It made more sense for us to become self-reliant in our urban environment. There was no need for us to wait to become farmers. We grow plenty of food in our backyard in Echo Park and even raise chickens. Once you taste lettuce that actually has a distinct flavor, or eat a sweet tomato still warm from the sun, or an orange-yolked egg from your own hen, you will never be satisfied with the pre-packaged and the factory-farmed again. Our next step down the homesteading path was learning to use the old home arts to preserve what we grew: pickling, fermenting, drying and brewing. A jar of jam that you make of wild blackberries holds memories of the summer, and not the air of the Smucker's factory.

When you grow some of your own food, you start to care more about all of your food. "Just where did this come from?" we'd find ourselves asking when we went shopping. What's in it? At the same time, we began to learn about
cultured and fermented foods, which have beneficial bacteria in them. Few of these wonder-foods are available in stores. The supermarket started to look like a wasteland.

A little history

The idea of urban farming is nothing new. Back in the days before freeways and refrigerated trucks,

cities depended on urban farmers for the majority of their fresh food. This included small farms around the city, as well as kitchen gardens. Even today, there are places that hold to this tradition. The citizens of Shanghai produce 85% of their vegetables within the city, and that's just one example of a long Asian tradition of intense urban gardening. Or consider Cuba. Cubans practiced centralized, industrial agriculture, just as we do, until the collapse of the Soviet Union in 1989. Overnight, Cubans were forced to shift from a large, petroleum-based system to small-scale farming, much of it in cities. Today, urban organic gardens produce half of the fresh fruits and vegetables consumed by Cubans.

The United States once was a nation of independent farmers. Today most of us do not know one end of a hoe from the other. In the last half of the 20th century, a cultural shift unique in human history came to pass. We convinced ourselves that we didn't need to have anything to do with our own food. Food, the very stuff of life, became just another commodity, an anonymous transaction. In making this transition, we sacrificed quality for convenience, and then we learned to forget the value of what we gave up.

Large agribusiness concerns offer us flavorless, genetically modified, irradiated, pesticide-drenched frankenvegetables. They are grown in such poor soil -- the result of short-sighted profit-based agricultural practices -- that they actually contain fewer nutrients than food grown in healthy soil. Our packaged foods are nutritionally bankrupt, and our livestock is raised in squalid conditions. The fact is that we live in an appalling time when it comes to food. True, we have a great abundance of inexpensive food in supermarkets, but the disturbing truth is that in terms of flavor, quality and nutrition, our

greatgrandparents ate better than we do.

There is a hidden cost behind our increasingly costly supermarket food. The French have a term, malbouffe, referring to junk food, but with broader, more sinister implications. Radical farmer José Bové, who was imprisoned for dismantling a McDonald's restaurant, explains the concept of malbouffe:

I initially used the word 'shit-food', but quickly changed it to malbouffe to avoid giving offense. The word just clicked -- perhaps because when you're dealing with food, quite apart from any health concerns, you're also dealing with taste and what we feed ourselves with. Malbouffe implies eating any old thing, prepared in any old way. For me, the term means both the standardization of food like McDonald's -- the same taste from one end of the world to the other -- and the choice of food associated with the use of hormones and Genetically Modified Organisms as well as the residues of pesticides and other things that can endanger health. -- The World is Not for Sale by José Bové and Franois Dufour

So what are the strategies urban homesteaders can follow to avoid malbouffe? Farmers' markets, co-ops and natural food stores serve as good supplements to the urban homestead, but we've found that growing our own
food, even just a little of it, rather than buying it, not only results in better quality food, it has changed our fundamental relationship to food and to the act of eating itself. Now, now not only do we know our crops are free of pesticides and GMOs but we discovered an entirely new world of taste and flavor that big agribusiness had stolen away from us. Growing your own food is an act of resistance. We can all join with José Bové in dismantling the corporations that feed us shit.

We've also shifted from being consumers to being producers. Sure we still buy stuff. Olive oil. Parmigiano reggiano. Wine. Flour. Chocolate. And we're no strangers to consumer culture, not above experiencing a little shiver of desire when walking into an Apple computer store. But still, we do not accept that spending is our only form of power. There is more power in creating than in spending. We are producers, neighbors, and friends. Think you don't have enough land to grow your food?

Change the way you see land.

Before you start thinking that you have to move somewhere else to grow your own food, take another look around. With a couple of notable exceptions, American cities sprawl. They are full of wasted space. As a homesteader,
you will begin to see any open space as a place to grow food. This includes front yards as well as backyards, vacant lots, parkways, alleyways, patios, balconies, window boxes, fire escapes and rooftops. Once you break out of the mental box that makes you imagine a vegetable garden as a fenced-off parcel of land with a scarecrow in it, you'll start to see the possibilities. Think jungle, not prairie. The truth is that you can grow a hell of a lot of food on a small amount of real estate. You can grow food whether you're in an apartment or a house, whether you rent or own.

Do you have 4' ? 8' feet of open ground? If you don't have a yard, do you have room on a patio or balcony for two or three plastic storage tubs? If you don't have that, then you could get a space in a community garden, a relative or neighbor's house, or become a pirate gardener, or an expert forager -- some of the tastiest greens and berries are wild and free for the taking.

Think you don't have time? Think again.

We homestead at our own pace, to suit ourselves. Some things, like bread baking, have become part of our regular routine. Other kitchen experiments, like making pickles, come and go as time allows. More ambitious projects, like installing a greywater system, take time up front, but save time once implemented. It's unlikely that we spend any more time on our food-producing yard than we would on a traditional lawn-and-roses-type yard. You can set up your urban (or suburban) farm so that it takes minimal time to keep it going -- we talk about ways to do that in this book.

Sometimes, when life gets too crazy, we don't do anything beyond the barest maintenance, and eat a lot of pizza. Nothing wrong with that.

Besides saving time, with the exception of a few ambitious projects, like converting to solar, everything we talk about in this book is also cost-effective. Homesteading is all about reusing, recycling, foraging and building things yourself. Seeds are cheap, composting is free. Nature is standing by, waiting to help. And as oil prices continue to rise along with the cost of food, learning to grow your own may be one of the wisest investments you can make.

The paradigm shift

Urban homesteading is an affirmation of the simple pleasures of life. When you spend a Saturday morning making a loaf of bread, or go out on a summer evening after work to sit with your chickens, or

take a deep breath of fresh-cut basil, you unplug yourself from the madness. Many of us spend a lot of each day in front of a computer. Homesteading hooks us into the natural world and the passing of the seasons, and reminds us of our place within the greater cycle of life.

Our style of homesteading is about desire. We bake our own bread because it is better than what we can buy. We raise our own hens because we like chickens, and we think their eggs are worth the trouble. Erik bicycles everywhere because that's a thrill for him. There's mead brewing in our guest bedroom because you can't buy mead at the corner liquor store -- and because fermentation is the closest thing to magic that we know.

Maybe you aren't so into gardening, but would like to brew your own beer. Maybe you'd like to tinker with a greywater system for your house. Maybe you want to make your own non-toxic cleaning products. Try it! Start by doing just one project, one experiment, and you may well unleash the homesteader within.

Kelly Coyne and Erik Knutzen are the authors of The Urban Homestead: Your Guide to Self-sufficient Living in the Heart of the City (Process Self-reliance Series, 2008). They happily farm in Los Angeles and run the urban homestead blog homegrownrevolution.org.

India: R&D centre for organic farming at Maval soon

Posted by: "Suresh Motwani" motwanisuresh07@yahoo.com motwanisuresh07

Sat May 31, 2008 1:21 am (PDT)

India: R&D centre for organic farming at Maval soon

The organic farming movement, which is still at a nascent stage in the country, will get a big boost with Asia's first research and development centre for organic farming coming up at Maval, about 50 km from here. Work on the centre is already underway, but it will take at least another year to start functioning.

At present there are only about three such institutes in the world - in the US, in South Africa and in the UK. The centre, to be funded by the International Institute of Sustainable Agriculture (IISA), will be run jointly by city-based Maharashtra Organic Farming Federation (MOFF), V.B. Foundation, an NGO, and the Organic Farming Association of India (OFAI).

The 55-acre research centre will also have a training institute, records office,

library, lobby office as well as a certification office for participatory guarantee scheme. "The training institute will also offer certificate, diploma and post-graduate courses in organic farming," said MOFF vice-chairman Dilip Baradkar.

"The courses will focus on farmers who want to shift to organic farming, courses for upgrading knowledge of organic farmers, training courses for trainers, awareness sessions for consumer groups, and training for school children for introduction of organic kitchen garden."

Source: timesofindia. indiatimes. com<http://timesofindia .indiatimes. com/Pune/RD_centre_ for_organic_ farming_at_ Maval_soon/ articleshow/ 3013732.cms>

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Tue, Dec 30, 2008 at 12:17 AM

Dear Ken,

Thank you for all the DVDs. Thank you for all the info. I am applying it in my own vegetable patch. It is working.

Got half a pocket of potatoes off a square metre. So would imagine about 10 pounds per square yard. This off previously dead low carbon soil. Sure next crop will be better. Got yams coming up on same spot already. Do you have any info on companion planting? Want to plant herbs and spices. I will send photo's.

Your advise is so simple. People do not believe me when I tell them. I am so excited about growing things now. This coming from a commercial plum farmer.

May you be blessed this holy season a thousand times more than you blessed me with you help.

Jeremy Karsen, tominifarms@gmail.com

Organic farming 'could feed Africa'

Traditional practices increase yield by 128 per cent in east Africa, says UN

By Daniel Howden in Nairobi
Wednesday, 22 October 2008

New evidence suggests that organic practices - derided by some as a Western lifestyle fad - are delivering sharp increases in yields, improvements in the soil and a boost in the income of Africa's small farmers

Organic farming offers Africa the best chance of breaking the cycle of poverty and malnutrition it has been locked in for decades, according to a major study from the United Nations to be presented today.

New evidence suggests that organic practices – derided by some as a Western lifestyle fad – are delivering sharp increases in yields, improvements in the soil and a boost in the income of Africa's small farmers who remain among the poorest people on earth. The head of the UN's Environment Programme, Achim Steiner, said the report "indicates that the potential contribution of organic farming to feeding the world maybe far higher than many had supposed".

The "green revolution" in agriculture in the 1960s – when the production of food caught and surpassed the needs of the global population for the first time – largely bypassed Africa. Whereas each person today has 25 per cent more food on average than they did in 1960, in Africa they have 10 per cent less.

A combination of increasing population, decreasing rainfall and soil fertility and a surge in food prices has left Africa uniquely vulnerable to famine. Climate change is expected to make a bad situation worse by increasing the frequency of droughts and floods.

It has been conventional wisdom among African governments that modern, mechanised agriculture was needed to close the gap but efforts in this direction have had little impact on food poverty and done nothing to create a sustainable approach. Now, the global food crisis has led to renewed calls for a massive modernisation of agriculture on the hungriest continent on the planet, with calls to push ahead with genetically modified crops and large industrial farms to avoid potentially disastrous starvation.

Last month the UK's former chief scientist Sir David King said anti-scientific attitudes among Western NGOs and the UN were responsible for holding back a much-needed green revolution in Africa. "The problem is that the Western world's move toward organic farming – a lifestyle choice for a community with surplus food – and against agricultural technology in general and GM in particular, has been adopted across the whole of Africa, with the exception of South Africa, with devastating consequences," he said.

The research conducted by the UN Environment Programme suggests that organic, small-scale farming can deliver the increased yields which were thought to be the preserve of industrial farming, without the environmental and social damage which that form of agriculture brings with it.

An analysis of 114 projects in 24 African countries found that yields had more than doubled where organic, or near-organic practices had been used. That increase in yield jumped to 128 per cent in east Africa.

"Organic farming can often lead to polarised views," said Mr Steiner, a former economist. "With some viewing it as a saviour and others as a niche product or something of a luxury... this report suggests it could make a serious contribution to tackling poverty and food insecurity."

The study found that organic practices outperformed traditional methods and chemical-intensive conventional farming. It also found strong environmental benefits such as improved soil fertility, better retention of water and resistance to drought. And the research highlighted the role that learning organic practices could have in improving local education. Backers of GM foods insist that a technological fix is

needed to feed the world. But this form of agriculture requires cash to buy the patented seeds and herbicides – both at record high prices currently – needed to grow GM crops.

Regional farming experts have long called for "good farming", rather than exclusively GM or organic. Better seeds, crop rotation, irrigation and access to markets all help farmers. Organic certification in countries such as the UK and Australia still presents an insurmountable barrier to most African exporters, the report points out. It calls for greater access to markets so farmers can get the best prices for their products.

Kenyan farmer: 'I wanted to see how UK did it'

Henry Murage had to travel a long way to solve problems trying to farm a smallholding on the western slopes of Mount Kenya. He spent five months in the UK, studying with the experts at Garden Organic a charity in the Midlands. "I wanted to see how it was being done in the UK and was convinced we could do some of the same things here," he says.

On his return 10 years ago, he set up the Mt Kenya Organic Farm, aimed at aiding other small farmers fighting the semi-arid conditions. He believes organic soil management can help retain moisture and protect against crop failure. The true test came during the devastating drought of2000-02, when Mr Murage's vegetable gardens fared better than his neighbours'. At least 300 farmers have visited his gardens and taken up at least one of the practices he espouses. "Organic can feed the people in rural areas," he says. "It's sustainable and what we produce now we can go on producing."

Saving money on fertilisers and pesticides helps farmers afford better seeds, and composting and crop rotation are improving the soil. Traditional maize, beans and livestock farming in the area have been supplemented with new crops from borage seeds to cayenne peppers and honey, with buyers from the US to Europe. Now he is growing camomile for herbal tea, with buyers from the UK and Germany both interested.

10 reasons why organic can feed the world

Date:01/03/2008 Author:Ed Hamer & Mark Anslow

http://www.theecologist.org/archive_detail.asp?content_id=1184

1. Yield

Switching to organic farming would have different effects according to where in the world you live and how you currently farm.

Studies show that the less-industrialised world stands to benefit the most. In southern Brazil, maize and wheat yields doubled on farms that changed to green manures and nitrogen-fixing leguminous vegetables instead of chemical fertilisers. In Mexico, coffee-growers who chose to move to fully organic production methods saw increases of 50 per cent in the weight of beans they harvested. In fact, in an analysis of more than 286 organic conversions in 57 countries, the average yield increase was found to be an impressive 64 per cent.

Research by the University of Essex in 1999 found that, although yields on US farms that converted to organic initially dropped by between 10 and 15 per cent, they soon recovered, and the farms became more productive than their all-chemical counterparts.

2. Energy

Currently, we use around 10 calories of fossil energy to produce one calorie of food energy. In a fuel-scarce future, which experts think could arrive as early as 2012, such numbers simply won't stack up. Studies by the Department for Environment, Food and Rural affairs over the past three years have

shown that, on average, organically grown crops use 25 per cent less energy than their chemical cousins. Certain crops achieve even better reductions, including organic leeks (58 per cent less energy) and broccoli (49 per cent less energy). When these savings are combined with stringent energy conservation and local distribution and consumption (such as organic box schemes), energy-use dwindles to a fraction of that needed for an intensive, centralised food system. A study by the University of Surrey shows that food from Tolhurst Organic Produce, a smallholding in Berkshire, which supplies 400 households with vegetable boxes, uses 90 per cent less energy than if non-organic produce had been delivered and bought in a supermarket.

Far from being simply 'energy-lite', however, organic farms have the potential to become self-sufficient in energy – or even to become energy exporters. The 'Dream Farm' model, first proposed by Mauritius-born agroscientist George Chan, sees farms feeding manure and waste from livestock and crops into biodigesters, which convert it into a methane-rich gas to be used for creating heat and electricity. The residue from these biodigesters is a crumbly, nutrient-rich fertiliser, which can be spread on soil to increase crop yields or further digested by algae and used as a fish or animal feed.

3. Greenhouse gas emissions and climate change

Despite organic farming's low-energy methods, it is not in reducing demand for power that the techniques stand to make the biggest savings in greenhouse gas emissions.

The production of ammonium nitrate fertiliser, which is indispensable to conventional farming, produces vast quantities of nitrous oxide – a greenhouse gas with a global warming potential some 320 times greater than that of CO2. In fact, the production of one tonne of ammonium nitrate creates 6.7

tonnes of greenhouse gases (CO^2e), and was responsible for around 10 per cent of all industrial greenhouse gas emissions in Europe in 2003.

The techniques used in organic agriculture to enhance soil fertility in turn encourage crops to develop deeper roots, which increase the amount of organic matter in the soil, locking up carbon underground and keeping it out of the atmosphere. The opposite happens in conventional farming: high quantities of artificially supplied nutrients encourage quick growth and shallow roots. A study published in 1995 in the journal Ecological Applications found that levels of carbon in the soils of organic farms in California were as much as 28 per cent higher as a result. And research by the Rodale Institute shows that if the US were to convert all its corn and soybean fields to organic methods, the amount of carbon that could be stored in the soil would equal 73 per cent of the country's (would-be) Kyoto targets for CO^2 reduction.8

Organic farming might also go some way towards salvaging the reputation of the cow, demonised in 2007 as a major source of methane at both ends of its digestive tract. There's no doubt that this is a problem: estimates put global methane emissions from ruminant livestock at around 80 million tonnes a year,9 equivalent to around two billion tonnes of CO^2,10 or close to the annual CO^2 output of Russia and the UK combined.11 But by changing the pasturage on which animals graze to legumes such as clover or birdsfoot trefoil (often grown anyway by organic farmers to improve soil nitrogen content), scientists at the Institute of Grassland and Environmental Research believe that methane emissions could be cut dramatically. Because the leguminous foliage is more digestible,
bacteria in the cow's gut are less able to turn the fodder into methane. Cows also seem naturally to prefer eating birdsfoot trefoil to ordinary grass.

4. Water use

Agriculture is officially the most thirsty industry on the planet, consuming a staggering 72 per cent of all global freshwater at a time when the UN says 80 per cent of our water supplies are being overexploited. This hasn't always been the case. Traditionally, agricultural crops were restricted to those areas best suited to their physiology, with drought-tolerant species grown in the tropics and water-demanding crops in temperate regions. Global trade throughout the second half of the last century led to a worldwide production of grains dominated by a handful of high-yielding cereal crops, notably wheat, maize and rice. These thirsty cereals – the 'big three' – now account for more than half of the world's plant-based calories and 85 per cent of total grain production.15

Organic agriculture is different. Due to its emphasis on healthy soil structure, organic farming avoids many of the problems associated with compaction, erosion, salinisation and soil degradation, which are prevalent in intensive systems. Organic manures and green mulches are applied even before the crop is sown, leading to a process known as 'mineralisation' – literally the fixing of minerals in the soil. Mineralised organic matter, conspicuously absent from synthetic fertilisers, is one of the essential ingredients required physically and chemically to hold water on the land.

Organic management also uses crop rotations, undersowing and mixed cropping to provide the soil with near-continuous cover. By contrast, conventional farm soils may be left uncovered for extended periods prior to sowing, and again following the harvest, leaving essential organic matter fully exposed to erosion by rain, wind and sunlight. In the US, a 25-year Rodale Institute experiment on climatic extremes found that, due to improved soil structure, organic systems consistently achieve higher yields during periods both of drought and flooding.

5. Localisation

The globalisation of our food supply, which gives us Peruvian apples in June and Spanish lettuces in February, has seen our food reduced to a commodity in an increasingly volatile global marketplace. Although year-round availability makes for good marketing in the eyes of the biggest retailers, the costs to the environment are immense.

Friends of the Earth estimates that the average meal in the UK travels 1,000 miles from plot to plate. In 2005, Defra released a comprehensive report on food miles in the UK, which valued the direct environmental, social and economic costs of food transport in Britain at £9 billion each year. In addition, food transport accounted for more than 30 billion vehicle kilometres, 25 per cent of all HGV journeys and 19 million tonnes of carbon dioxide emissions in 2002 alone.

The organic movement was born out of a commitment to provide local food for local people, and so it is logical that organic marketing encourages localisation through veg boxes, farm shops and stalls. Between 2005 and 2006, organic sales made through direct marketing outlets such as these increased by 53 per cent, from £95 to £146 million, more than double the sales growth experienced by the major supermarkets. As we enter an age of unprecedented food insecurity, it is essential that our consumption reflects not only what is desirable, but also what is ultimately sustainable. While the 'organic' label itself may inevitably be hijacked, 'organic and local' represents a solution with which the global players can simply never compete.

6. Pesticides

It is a shocking testimony to the power of the agrochemical industry that in the 45 years since Rachel Carson published her pesticide warning Silent Spring, the number of commercially available synthetic pesticides has risen from 22 to more than 450.

According to the World Health Organization there are an estimated 20,000 accidental deaths worldwide each year from pesticide exposure and poisoning.22 More than 31 million kilograms of pesticide were applied to UK crops alone in 2005, 0.5 kilograms for every person in the country. A spiralling dependence on pesticides throughout recent decades has resulted in a catalogue of repercussions, including pest resistance, disease susceptibility, loss of natural biological controls and reduced nutrient-cycling.

Organic farmers, on the other hand, believe that a healthy plant grown in a healthy soil will ultimately be more resistant to pest damage. Organic systems encourage a variety of natural methods to enhance soil and plant health, in turn reducing incidences of pests, weeds and disease.

First and foremost, because organic plants grow comparatively slower than conventional varieties they have thicker cell walls, which provide a tougher natural barrier to pests. Rotations or 'break-crops', which are central to organic production, also provide a physical obstacle to pest and disease lifecycles by removing crops from a given plot for
extended periods. Organic systems also rely heavily on a rich agro-ecosystem in which many agricultural pests can be controlled by their natural predators.

Inevitably, however, there are times when pestilence attacks are especially prolonged or virulent, and here permitted pesticides may be used. The use of organic pesticides is heavily regulated and the International Federation of Organic Agriculture Movements (IFOAM) requires specific criteria to be met before pesticide applications can be justified.26

There are in fact only four active ingredients permitted for use on organic crops: copper fungicides, restricted largely to potatoes and occasionally orchards; sulphur, used to control additional elements of fungal diseases; Retenone, a naturally occurring plant extract, and soft soap, derived from potassium soap and used to control aphids. Herbicides are entirely prohibited.

7. Ecosystem impact

Farmland accounts for 70 per cent of UK land mass, making it the single most influential enterprise affecting our wildlife. Incentives offered for intensification under the Common Agricultural Policy are largely responsible for negative ecosystem impacts over recent years. Since 1962, farmland bird numbers have declined by an average of 30 per cent. During the same period more than 192,000 kilometres of hedgerows have been removed, while 45 per cent of our ancient woodland has been converted to cropland.

By contrast, organic farms actively encourage biodiversity in order to maintain soil fertility and aid natural pest control. Mixed farming systems ensure that a diversity of food and nesting sites are available throughout the year, compared with conventional farms where autumn sow crops leave little winter vegetation available.

Organic production systems are designed to respect the balance observed in our natural ecosystems. It is widely accepted that controlling or suppressing one element of wildlife, even if it is a pest, will have unpredictable impacts on the rest of the food chain. Instead, organic producers regard a healthy ecosystem as essential to a healthy farm, rather than a barrier to production. In 2005, a report by English Nature and the RSPB on the impacts of organic farming on biodiversity reviewed more than 70 independent studies of flora, invertebrates, birds and mammals within organic and conventional farming systems. It concluded that biodiversity is enhanced at every level of the food chain under organic management practices, from soil micro-biota right through to farmland birds and the largest mammals.

8. Nutritional benefits

While an all-organic farming system might mean we'd have to make do with slightly less food than we're used to, research shows that we can rest assured it would be better for us. In 2001, a study in the Journal of Complementary Medicine found that organic crops contained higher levels of 21 essential nutrients than their conventionally grown counterparts, including iron, magnesium, phosphorus and vitamin C. The organic crops also contained lower levels of nitrates, which can be toxic to the body. Other studies have found significantly higher levels of vitamins – as well as polyphenols and antioxidants – in organic fruit and veg, all of which are thought to play a role in cancer-prevention within the body.

Scientists have also been able to work out why organic farming produces more nutritious food. Avoiding chemical fertiliser reduces nitrates levels in the food; better quality soil increases the availability of trace minerals, and reduced levels of pesticides mean that the plants' own immune systems grow stronger, producing higher levels

ofantioxidants. Slower rates of growth also mean that organic food frequently contains higher levels of dry mass, meaning that fruit and vegetables are less pumped up with water and so contain more nutrients by weight than intensively grown crops do. Milk from organically fed cows has been found to contain higher levels of nutrients in six separate studies, including omega-3 fatty acids, vitamin E, and beta-carotene, all of which can help prevent cancer. One experiment discovered that levels of omega-3 in organic milk were on average 68 per cent higher than in non-organic alternatives.

But as well as giving us more of what we do need, organic food can help to give us less of what we don't. In 2000, the UN Food and Agriculture Organization (FAO) found that organically produced food had 'lower levels of pesticide and veterinary drug residues' than non-organic did.35 Although organic farmers are allowed to use antibiotics when absolutely necessary to treat disease, the routine use of the drugs in animal feed – common on intensive livestock farms – is forbidden. This means a shift to organic livestock farming could help tackle problems such as the emergence of antibiotic-resistant bacteria.

9. Seed-saving

Seeds are not simply a source of food; they are living testimony to more than 10,000 years of agricultural domestication. Tragically, however, they are a resource that has suffered unprecedented neglect. The UN FAO estimates that 75 per cent of the genetic diversity of agricultural crops has been lost over the past 100 years.

Traditionally, farming communities have saved seeds year-on-year, both in order to save costs and to trade with their neighbours. As a result, seed varieties evolved in response to local climatic and seasonal

conditions, leading to a wide variety of fruiting times, seed size, appearance and flavour. More importantly, this meant a constant updating process for the seed's genetic resistance to changing climatic conditions, new pests and diseases.

By contrast, modern intensive agriculture depends on relatively few crops – only about 150 species are cultivated on any significant scale worldwide. This is the inheritance of the Green Revolution, which in the late 1950s perfected varieties Filial 1, or F1 seed technology, which produced hybrid seeds with specifically desirable genetic qualities. These new high-yield seeds were widely adopted, but because the genetic makeup of hybrid F1 seeds becomes diluted following the first harvest, the manufacturers ensured that farmers return for more seed year on year.

With its emphasis on diversity, organic farming is somewhat cushioned from exploitation on this scale, but even Syngenta, the world's third-largest biotech company, now offers organic seed lines. Although seed saving is not a prerequisite for organic production, the holistic nature of organics lends itself well to conserving seed. In support of this, the Heritage Seed Library, in Warwickshire, is a collection of more than 800 open-pollinated organic varieties, which have been carefully preserved by gardeners across the country. Although their seeds are not yet commercially available, the Library is at the forefront of addressing the alarming erosion of our agricultural diversity. Seed-saving and the development of local varieties must become a key component of organic farming, giving crops the potential to evolve in response to what could be rapidly changing climatic conditions. This will help agriculture keeps pace with climate change in the field, rather than in the laboratory.

10. Job creation

There is no doubt British farming is currently in crisis. With an average of 37 farmers leaving the land every day, there are now more prisoners behind bars in the UK than there are farmers in the fields. Although it has been slow, the decline in the rural labour force is a predictable consequence of the industrialisation of agriculture. A mere one per cent of the UK workforce is now employed in land-related enterprises, compared with 35 per cent at the turn of the last century. The implications of this decline are serious. A skilled agricultural workforce will be essential in order to maintain food security in the coming transition towards a new model of post-fossil fuel farming. Many of these skills have already been eroded through mechanisation and a move towards more specialised and intensive production systems.

Organic farming is an exception to these trends. By its nature, organic production relies on labour-intensive management practices. Smaller, more diverse farming systems require a level of husbandry that is simply

uneconomical at any other scale. Organic crops and livestock also demand specialist knowledge and regular monitoring in the absence of agrochemical controls. According to a 2006 report by the University of Essex, organic farming in the UK provides 32 per cent more jobs per farm than comparable non-organic farms. Interestingly, the report also concluded that the higher employment observed could not be replicated in non-organic farming through initiatives such as local marketing. Instead, the majority (81 per cent) of total employment on organic farms was created by the organic production system itself. The report estimates that 93,000 new jobs would be created if all farming in the UK were to convert to organic.

Organic farming also accounts for more younger employees than any other sector in the industry. The average age of conventional UK farmers is now 56, yet organic farms increasingly attract a younger more enthusiastic workforce, people who view organics as the future of food production. It is for this next generation of farmers that Organic Futures, a campaign group set up by the Soil Association in 2007, is striving to provide a platform.

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Organic Cuba without Fossil Fuels

Cuba's experience has opened our eyes to agriculture without fossil fuels, a possibility rapidly turning into a necessity for mitigating climate change as world production of petroleum has also peaked. Dr. Mae-Wan Ho

Cuba 1989

Cuba is where agriculture without fossil fuels has been put to its greatest test, and it has passed with flying colours. The year 1989 ushered in the "Special Period" [1] a scenario that will hit some countries in the not too distant future unless they prepare for it right now.

Before 1989, Cuba was a model Green Revolution farm economy, based on huge production units of state-owned farms, and dependent on vast quantities of imported oil, chemicals and machinery to produce export crops. Under agreements with the former Soviet Union, Cuba had been an oil-driven country, and 98 percent of all its petroleum had come from the Soviet bloc. In 1988, 12-13 million tons of Soviet oil were imported and of this, Cubans re-exported two million tons. In 1989, Cuba was forced to cut the re-export in half and in 1990, oil exports were cut entirely as only 10 of 13m tons promised by

the Soviet had been received. At the end of 1991, only 6 of the promised 13 m tons was received, and the short fall in oil began to severely affect the nation's economy.

While oil was critical, other losses were also important, as 85 percent of all Cuba's trade was with the Soviets. Cuba exported 66 percent of all sugar and 98 percent of its citrus fruit to the Soviet bloc, and imported from them 66 percent of its food, 86 percent of all raw materials, and 80 percent of machinery and spare parts. Consequently, when support from the Soviet bloc was withdrawn, factories closed, food scarcity was widespread and an already inadequate technology base began eroding.

The collapse of the Soviet bloc and the tightened US trade embargo exposed the vulnerability of Cuba's Green Revolution model, and it was plunged into the worst food crisis in its history [2].

In early 1990, a survival economy was put in place as 100 000 tons of wheat normally obtained through barter arrangements failed to arrive and the government had to use scarce hard currency to import grain from Canada [1]. The price of food went up and bread had to be rationed. Overall, food consumption was said to decrease by 20 percent in calories and 27 percent in protein between 1989 and 1992.

To make matters worse, Cuba's efforts to reverse the trend of rural-urban migration over the past decades failed to stem the increasing tides of rural migrants to the cities, especially to Havana. In 1994, 16 541 migrated to Havana from all over Cuba, more than any year since 1963. By 1996, the figure had

reached 28 193, at pre-revolution level. Shortages of food and medicine and gasoline were driving people to the capital.

Policies to stop the inflow were put in place in 1997, but not before the population density in the capital reached 3 000 inhabitants per square kilometer.

Cuba was faced with a dual challenge of doubling food production with half the previous inputs, with some 74 percent of its population living in cities. Yet by 1997, Cubans were eating almost as well as they did before 1989, with little food and agrochemicals imported. Instead, Cuba concentrated on creating a more self-reliant agriculture: a combination of higher crop prices paid to farmers, agroecological technology, smaller production units, and most importantly, urban agriculture. Urbanization is a growing trend worldwide. More people now live in cities than in the countryside. By 2015 about 26 cities in the world are expected to have populations of 10 million or more. To feed cities of this size require at least 6 000 tons of food a day [1].

The Cuban response

The way Cuba responded was an inspiration to the rest of the world. It began with a nation-wide call to increase food production by restructuring agriculture. It involved converting from conventional large-scale, high input monoculture systems to smaller scale, organic and semi-organic farming systems. The focus was on using low cost and environmentally safe inputs, and relocating production closer to

consumption in order to cut down on transportation costs, and urban agriculture was a key part of this effort [2-5].

A spontaneous, decentralized movement had arisen in the cities. People responded enthusiastically to government initiative. By 1994, more than 8 000 city farms were created in Havana alone. Front lawns of municipal buildings were dug up to grow vegetables. Offices and schools cultivated their own food. Many of the gardeners were retired men aged 50s and 60s, and urban women played a much larger role in agriculture than their rural counterparts.

By 1998, an estimated 541 000 tons of food were produced in Havana for local consumption. Food quality has also improved as people had access to a greater variety of fresh fruits and vegetables. Urban gardens continued to grow and some neighborhoods were producing as much as 30 percent of their own food.

The growth of urban agriculture was largely due to the State's commitment to make unused urban and suburban land and resources available to aspiring urban farmers. The issue of land grants in the city converted hundreds of vacant lots into food producing plots, and new planning laws placed the highest land use priority on food production.

Another key to success was opening farmers markets and legalizing direct sales from farmers to consumers. Deregulation of prices combined with high demand for fresh produce in the cities allowed urban farmers to make two to three times as much as the rural professionals.

The government also encouraged gardeners through an extensive support system including extension agents and horticultural groups that offered assistance and advice. Seed houses throughout the city sold seeds, gardening tools, compost and distribute biofertilizers and other biological control agents at low costs.

New biological products and organic gardening techniques were developed and produced by Cuba's agricultural research sector, which had already begun exploring organic alternatives to chemical controls, enabling Cuba's urban farms to become completely organic. In fact, a new law prohibited the use of any pesticides for agricultural purposes anywhere within city limits.

The introduction of a diversified market-based system for food distribution has spurred increased agricultural productivity [1]. The United Nations Food and Agriculture Organization estimated that between 1994 and 1998, Cuba tripled the production of tubers and plantains, and doubled the production of vegetables, which doubled again in 1999. Potatoes increased from 188 000 tones in 1994 to 330 000 tones in 1998, while beans increased by 60 percent and citrus by 110 percent from 1994 to 1999.

Anecdotal information suggests that thousands of families have left cities and large towns to make their livelihood from the land. Other information suggests that thousands of unemployed – including rural migrants – have found employment in urban agriculture.

Rural agroecology and land restructuring

Agroecological methods were introduced into Cuba's rural communities largely out of the necessity of coping without artificial fertilizers and pesticides; but this was also amply supported with substantial government resources, state-funded research, and fundamental policy shifts at the highest levels of government [1]. Agroecological farming in the countryside and organic urban agriculture were the key to stabilizing both urban and rural populations.

The agroecological methods introduced include locally produced biopesticides and biofertilizers substituting for the artificial chemical inputs, complex agrosystems designed to take advantage of ecological interactions and synergisms between biotic and abiotic factors that enhance soil fertility, biological pest control, and achieving higher productivity through internal processes. Other practices involve increased recycling of nutrients and biomass within the system, addition of organic matter to improve soil quality and activate soil biology, soil and water conservation, diversification of agrosystems in time and space, integration of crops and livestock, and integration of farm components to increase biological efficiencies and preserve productive capacity.

In 1993, the Cuban government unveiled a major reorganization of agriculture, restructuring state farms as private cooperatives. The new farms, which now make up the largest sector in Cuba agriculture) were called UBPCs or Basic Units of Cooperative Production, based on a growing perception that smaller farms would be more easily managed and better able to take on the sustainable agriculture practices.

The state retains ownership of the land, leasing it on a long-term basis, but rent-free. The cooperative, not the state, owns the production, and the members' earnings are based on their share of the cooperative's income. The UBPC also owns buildings and farm equipment, purchased from the government at discount prices with long-term, low interest loans (4 percent). Most UBPCs produce sugar at given quotas, limiting any other crops that they might produce, so they have little to sell in agricultural markets, which restricts their options and income.

In addition to the UBPCs, the break up of large state farms has freed large plots of land for other use, and land has been turned over to both private farmers and agricultural cooperatives.

Small farmers working on privately owned farms and in cooperatives have made major contributions to the successful implementation of agroecology in the countryside.

Agricultural Production Cooperatives (CPAs) were first created 20 to 30 years ago by farmers who chose to pool their land and resources to attain greater production and marketing and economic efficiency.

Although the CPAs were of minimal importance then, they began to rebound in the early 1990s. The UBPCs were modelled after them, except that farmers in the CPAs owned their land.

The Credit and Service Cooperative (CCS) is an association of small landowners joining up with other small farmers to receive credit and services from state agencies. They may also share machinery and equipment, and thus are able to take advantage of economies of scale. CCS members purchase inputs and sell products at fixed prices through state agencies, based on production plans and contracts established with the state distribution system. Any production above and beyond the contracted quantity may be sold in farmers' markets at free market prices. These small farmers have been the most productive sector in Cuban agriculture, outperforming both the CPAs and UBPCs. CCS farmers have higher incomes than members of other cooperatives.

While all farmers continue to sell a percentage of their produce to the state marketing board, farmers are now motivated to produce in excess of their agreed quota, which they can sell to agricultural markets, often at twice the contracted government price. They can triple or quadruple their income.

The urban agricultural miracle

Today, Vivero Alamar (Alamar Gardens) is an oasis amid the monotonous array of perfectly rectangular apartment blocks of Soviet-style housing in the Alamar district of eastern Havana. It is a 27-acre organic

farm set in the middle of a city of two million people. Founded in 1994 on a small 9-acre parcel of land, it has become a 140-person business [6] producing a steady harvest of a wide range of fruits and vegetables: lettuces, carrots, tomatoes, avocadoes, culinary and medicinal herbs, chard and cucumbers. After harvest the crops are sold directly to neighbors at a colorful farm stand. Vivero Alamar also sells a range of organic composts and mulches and a selection of patio plants. In 2005, this neighborhood-managed worker-owned cooperative earned approximately $180 000. After capital improvements and operating expenses, it pays each worker about $500 a year; compared to the Cuban minimum wage of $10 a month. Vivero Alamar is just one example of the revolution in food production that has swept Cuba in the early 1990s and continues today. From Santiago de Cuba in the east to Pinar del Rio in the west, thousands of urban gardens are blossoming. Some 300 000 Cubans are busy growing their own fruits and vegetables and selling the surplus to their neighbors.

Although urban agriculture is totally organic, the country as a whole is not. But the amount of chemical inputs has been drastically reduced. Before the crisis hit in 1989, Cuba used more than 1 million tons of synthetic fertilizers a year. Today, it uses about 90 000 tons. During the Soviet period, Cuba applied up to 35 000 tons of herbicides and pesticides a year, today, it is about 1 000 tons

Like many small poor countries, Cuba remains reliant on export agriculture to earn hard currency. It is a robust exporter of tobacco, sugar, coffee, and citruses, and is selling a significant amount of the last

three as certified organic [7]. Foreign investment in such ventures is on the rise. But when it comes to sustainable agriculture, Cuba's most impressive innovation is its network of urban farms and gardens.

According to Cuba's Ministry of Agriculture, some 150 000 acres of land is being cultivated in urban and suburban settings, in thousands of community farms, ranging from modest courtyards to production sites that fill entire city blocks. Organoponicos, as they are called, show how a combination of grassroots effort and official support can result in sweeping change, and how neighbors can come together and feed themselves. When the food crisis hit, the organoponicos were an *ad hoc* response by local communities to increase the amount of available food. But as the power of the community farming movement became obvious, the Cuban government stepped in to provide key infrastructure support and to assist with information dissemination and skills sharing.

Most organoponicos are built on land unsuitable for cultivation; they rely on raised planter beds. Once the organoponicos are laid out, the work remains labor-intensive. All planting and weeding is done by hand, as is harvesting. Soil fertility is maintained by worm composting. Farms feed their excess biomass, along with manure from nearby rural farms to worms that produce a nutrient-rich fertilizer. Crews spread about two pound of compost per square yard on the bed tops before each new planting.

Jason Marks writes [6]: "Despite the tropical heat, it doesn't look like drudgery. Among organoponico employees, there is a palpable pride in their creation. The atmosphere is cooperative and congenial

There is no boss in sight, and each person seems to understand well their role and what's expected of them. The work occurs fluidly, with a quiet grace."

Gardeners come from all walks of life: artists, doctors, teachers. Fernando Morel, president of the Cuban Association of Agronomists said: "It's amazing. When we had more resources in the 80s, oil and everything, the system was less efficient than it is today."

The hybrid public-private partnership appears to work well. In return for providing the land, the government receives a portion of the produce, usually about one-fifth of the harvest, to use at state-run daycare centres, schools and hospitals. The workers get to keep the rest to sell at produce stands located right at the farm. It is more than fair trade.

The City of Havana now produces enough food for each resident to receive a daily serving of 280 g of fruits and vegetables a day. The UN food program recommends 305 g.

Joe Kovach, an entomologist from Ohio State University who visited Cuba on a 2006 research delegation sums up the situation: " In 25 years of working with farmers, these are the happiest, most optimistic, and best-paid farmers I have ever met."

Long queues of shoppers form at the farm stalls, people are shopping for quality and freshness, the produce is harvested as they buy, reducing waste to a minimum.

Urban agriculture nationwide reduces the dependence of urban populations on rural produce. Apart from organoponicos, there are over 104 000 small plots, patios and popular gardens, very small parcels of land covering an area of over 3 600 ha, producing more than the organoponicos and intensive gardens combined [1]. There are also self-provisioning farms around factories, offices and business, more than 300 in Havana alone. Large quantities of vegetables, root crops, grains, and fruits are produced, as well as milk, meat, fish eggs and herbs. In addition, suburban farms are intensively cultivated with emphasis on efficient water use and maximum reduction of agrotoxins; these are very important in Havana, Santa Clara, Sancti Spiritus, Camaguey, and Santiago de Cuba. Shaded cultivation and Apartment-style production allow year-round cultivation when the sun is at its most intense. Cultivation is also done with diverse soil substrate and nutrient solutions, mini-planting beds, small containers, balconies, roofs, etc. with minimal use of soil. Production levels of vegetables have double or tipled every year since 1994, and urban gardens now produce about 60 percent of all vegetables consumed in Cuba, but only 50 percent of all vegetables consumed in Havana.

The success of urban agriculture is put down to the average Cuban citizen's commitment to the ideal of local food production [7]. There is so much for the world to learn from the Cuban experience, not least

of which, agriculture without fossil fuels is not only possible but also highly productive and health promoting in more ways than one.

Organic farming 'could feed Africa'

Traditional practices increase yield by 128 per cent in east Africa, says UN
http://www.independent.co.uk/news/world/africa/organic-farming-could-feed-africa-968641.html
By Daniel Howden in Nairobi
Wednesday, 22 October 2008

Organic farming offers Africa the best chance of breaking the cycle of poverty and malnutrition it has been locked in for decades, according to a major study from the United Nations to be presented today.

New evidence suggests that organic practices – derided by some as a Western lifestyle fad – are delivering sharp increases in yields, improvements in the soil and a boost in the income of Africa's small farmers who remain among the poorest people on earth. The head of the UN's Environment Programme, Achim Steiner, said the report "indicates that the potential contribution of organic farming to feeding the world maybe far higher than many had supposed".

The "green revolution" in agriculture in the 1960s – when the production of food caught

and surpassed the needs of the global population for the first time – largely bypassed Africa. Whereas each person today has 25 per cent more food on average than they did in 1960, in Africa they have 10 per cent less.

A combination of increasing population, decreasing rainfall and soil fertility and a surge in food prices has left Africa uniquely vulnerable to famine. Climate change is expected to make a bad situation worse by increasing the frequency of droughts and floods.

It has been conventional wisdom among African governments that modern, mechanised agriculture was needed to close the gap but efforts in this direction have had little impact on food poverty and done nothing to create a sustainable approach. Now, the global food crisis has led to renewed calls for a massive modernisation of agriculture on the hungriest continent on the planet, with calls to push ahead with genetically modified crops and large industrial farms to avoid potentially disastrous starvation.

Last month the UK's former chief scientist Sir David King said anti-scientific attitudes among Western NGOs and the UN were responsible for holding back a much-needed green revolution in Africa. "The problem is that the Western world's move toward organic farming – a lifestyle choice for a community with surplus food – and against agricultural technology in general and GM in particular, has been adopted across the whole of Africa,

with the exception of South Africa, with devastating consequences," he said.

The research conducted by the UN Environment Programme suggests that organic, small-scale farming can deliver the increased yields which were thought to be the preserve of industrial farming, without the environmental and social damage which that form of agriculture brings with it.

An analysis of 114 projects in 24 African countries found that yields had more than doubled where organic, or near-organic practices had been used. That increase in yield jumped to 128 per cent in east Africa.

"Organic farming can often lead to polarised views," said Mr Steiner, a former economist. "With some viewing it as a saviour and others as a niche product or something of a luxury... this report suggests it could make a serious contribution to tackling poverty and food insecurity."

The study found that organic practices outperformed traditional methods and chemical-intensive conventional farming. It also found strong environmental benefits such as improved soil fertility, better retention of water and resistance to drought. And the research highlighted the role that learning organic practices could have in improving local

education. Backers of GM foods insist that a technological fix is needed to feed the world. But this form of agriculture requires cash to buy the patented seeds and herbicides – both at record high prices currently – needed to grow GM crops.

Regional farming experts have long called for "good farming", rather than exclusively GM or organic. Better seeds, crop rotation, irrigation and access to markets all help farmers. Organic certification in countries such as the UK and Australia still presents an insurmountable barrier to most African exporters, the report points out. It calls for greater access to markets so farmers can get the best prices for their products.

Kenyan farmer: 'I wanted to see how UK did it'

Henry Murage had to travel a long way to solve problems trying to farm a smallholding on the western slopes of Mount Kenya. He spent five months in the UK, studying with the experts at Garden Organic a charity in the Midlands. "I wanted to see how it was being done in the UK and was convinced we could do some of the same things here," he says.

On his return 10 years ago, he set up the Mt Kenya Organic Farm, aimed at aiding other small farmers fighting the semi-arid conditions. He believes organic soil management can help retain moisture and protect against crop failure. The true test came during the

devastating drought of2000-02, when Mr Murage's vegetable gardens fared better than his neighbours'. At least 300 farmers have visited his gardens and taken up at least one of the practices he espouses. "Organic can feed the people in rural areas," he says. "It's sustainable and what we produce now we can go on producing."

Saving money on fertilisers and pesticides helps farmers afford better seeds, and composting and crop rotation are improving the soil. Traditional maize, beans and livestock farming in the area have been supplemented with new crops from borage seeds to cayenne peppers and honey, with buyers from the US to Europe. Now he is growing camomile for herbal tea, with buyers from the UK and Germany both interested.

Organic farming can feed the world, U-M study shows

ANN ARBOR, Mich.—Organic farming can yield up to three times as much food on individual farms in developing countries, as low-intensive methods on the same land—according to new findings which refute the long-standing claim that organic farming methods cannot produce enough food to feed the global population.

Researchers from the University of Michigan found that in developed countries, yields were almost equal on organic and conventional farms. In developing countries, food production could double or triple using organic methods, said Ivette Perfecto, professor at U-M's School of Natural Resources and Environment, and one the study's principal investigators. Catherine Badgley, research scientist in the Museum of Paleontology, is a co-author of the paper along with several current and former graduate and undergraduate students from U-M.

"My hope is that we can finally put a nail in the coffin of the idea that you can't produce enough food through organic agriculture," Perfecto said.

In addition to equal or greater yields, the authors found that those yields could be accomplished using existing quantities of organic fertilizers, without putting more farmland into production.

The idea to undertake an exhaustive review of existing data about yields and nitrogen availability was fueled in a roundabout way, when Perfecto and Badgley were teaching a class about the global food system and visiting farms in Southern Michigan.

"We were struck by how much food the organic farmers would produce," Perfecto said. The researchers set about compiling data from published literature to investigate the two chief objections to organic farming: low yields and lack of organically acceptable nitrogen sources.

Their findings refute those key arguments, Perfecto said, and confirm that organic farming is less environmentally harmful yet can potentially produce more than enough food. This is especially good news for developing countries, where it's sometimes impossible to deliver food from outside, so farmers must supply their own. Yields in developing countries could increase dramatically by switching to organic farming, Perfecto said.

While that seems counterintuitive, it makes sense because in developing countries, many farmers still do not have the access to the expensive fertilizers and pesticides that farmers use in developed countries to produce those high yields, she said.

After comparing yields of organic and non-organic farms, the researchers looked at nitrogen availability. To do so, they multiplied the current farm land area by the average amount of nitrogen available for production crops if so-called "green manures" were planted between growing seasons. Green manures are cover crops which are plowed into the soil to provide natural soil amendments. They found that

planting green manures between growing seasons provided enough nitrogen to replace synthetic fertilizers.

Organic farming is important because conventional agriculture—which involves high-yielding plants, mechanized tillage, synthetic fertilizers and biocides—is so detrimental to the environment, Perfecto said. For instance, fertilizer runoff from conventional agriculture is the chief culprit in creating dead zones—low oxygen areas where marine life cannot survive. Proponents of organic farming argue that conventional farming also causes soil erosion, greenhouse gas emission, increased pest resistance and loss of biodiversity.

For their analysis, researchers defined the term organic as: practices referred to as sustainable or ecological; that utilize non-synthetic nutrient cycling processes; that exclude or rarely use synthetic pesticides; and sustain or regenerate the soil quality.

Perfecto said the idea that people would go hungry if farming went organic is "ridiculous."

"Corporate interest in agriculture and the way agriculture research has been conducted in land grant institutions, with a lot of influence by the chemical companies and pesticide companies as well as fertilizer companies—all have been playing an important role in convincing the public that you need to have these inputs to produce food," she said.

Prince Charles Speaks for the People and for Many Scientists Too

Prince Charles first spoke out against genetic modification in the 2000 Reith Lecture Respect for the Earth when he was viciously attacked by the scientific establishment; this was one of the very few articles defending him that got into the mainstream media and is just as relevant today as it was then.

Dr. Mae-Wan Ho

Prince Charles embarrassed the government and the scientific establishment with his Reith lecture broadcast on BBC Radio 4 (17 May 2000). In his wide ranging talk, which drew on the work of theologians, philosophers, scientists and economists, he said much that surely expressed the views of the majority in this country. Is it possible that the prince is more in touch with the common people than our elected Government?

The idea that there is a sacred trust under which human beings accept stewardship for the earth is common to most
spiritual traditions, including those that do not acknowledge a Creator. The Prince urged us to recapture this sense of the sacred, in which we accept that there are bounds of balance, order and harmony in the natural world and that development is progress only if

it is sustainable. He singled out gene biotechnology (genetic modification) for attack as an unacceptable transgression of Nature's limits, treating our entire world as a "laboratory of life" with potentially disastrous consequences.

Did he attack science? Was he anti-science, as has been claimed? Not at all. Many scientists, me included, were quite comfortable with what he said. His attack was aimed at the "impenetrable layers of scientific rationalism" (he might have said, "rationalisation") that obscure our sense of the sacred and respect for the earth, and in the end lead us to regard the whole of nature, including human beings, as something that can be "engineered for our own convenience or as a nuisance to be evaded and manipulated". That view may indeed infect science, but it is not at all inherent to it.

Nor does one have to believe in a Creator to agree with Prince Charles that that there is a "perfect unity, order, wisdom and design of the natural world" and opposing British philosopher Bertrand Russell's view that that the universe is "all spots and jumps" without continuity, coherence or orderliness.

Prince Charles is speaking for the people when he called for support for organic farming. Who could disagree when he argued that if a fraction of the money currently being invested in developing genetically manipulated crops were applied to understanding and improving traditional systems of agriculture, which have stood the all-important test of time, the results would be "remarkable"?

Read the rest of this article here http://www.i-sis.org.uk/PrinceCharlesSpeaks.php

R&D CENTRE FOR ORGANIC FARMING AT MAVAL

From: Krishak Samaya <krishak.samaya@ gmail.com>
Date: Aug 18, 2008 10:12 AM
Subject: &D CENTRE FOR ORGANIC FARMING AT MAVAL
To: krishak.samaya@ gmail.com

Pune : The organic farming movement, which is still at a nascent stage in the country, will get a big boost with Asia's first research and development centre for organic farming coming up at Maval, about 50 km from here.

Work on the centre is already underway, but it will take at least another year to start functioning.

At present there are only about three such institutes in the world in the US, in South Africa and in the UK.

The centre, to be funded by the International Institute of Sustainable Agriculture (IISA), will be run jointly by city based Maharashtra Organic Farming Federation (MOFF), V.B. Foundation, an NGO, and the Organic Farming Association of India

(OFAI).

The 55-acre research centre will also have a training institute, records office, library, lobby office as well as a certification office for participatory guarantee scheme.

"The training institute will also offer certificate, diploma and post-graduate courses in organic farming," said MOFF vice-chairman Dilip Baradkar. "The courses will focus on farmers who want to shift to organic
farming courses for upgrading knowledge of organic farmers, courses for upgrading knowledge of organic farmers, trainers courses for trainers, awareness sessions for consumer groups, and training for school children for introduction of organic kitchen garden."

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KRISHAK SAMAYA
(A News Paper dedicated to Agri & Rural Development)
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AlterNet
The Mix is the Message

Soil Not Oil: Why We Need to Kick Petroleum Out of Our Farms
By Vandana Shiva, South End Press
Posted on December 3, 2008, Printed on December 3, 2008
http://www.alternet.org/story/109576/

The following is an excerpt from Soil Not Oil: Environmental Justice in an Age of Climate Crisis by Vandana Shiva (South End Press, 2008).

The industrialized, globalized food system is based on oil. It is under threat because of the inevitability of "peak oil." It is also under threat because it is more vulnerable than traditional agriculture to climate change, to which it has contributed. Industrial agriculture is based on monocultures. Monocultures are highly vulnerable to changes in climate, and to diseases and pests.

In 1970 and 1971, America's vast corn belt was attacked by a mysterious disease, later identified as ''race T" of the fungus *Helminthosporium maydis*, causing the southern corn leaf blight, as the epidemic was called. It left ravaged cornfields with withered plants, broken stalks, and malformed or completely rotten cobs. The strength and speed of the blight was a result of the uniformity of the hybrid corn, most of which had been derived from a single Texas male sterile line. The genetic makeup of the new hybrid corn, which was responsible for its rapid and large-scale breeding by seed companies, was also

responsible for its vulnerability to disease. At least 80 percent of the hybrid corn in America in 1970 contained the Texas male sterile cytoplasm. As a University of Iowa pathologist wrote, "Such an extensive, homogenous acreage is like a tinder-dry prairie waiting for a spark to ignite it."

Industrial agriculture is dependent on chemical fertilizers. Chemically fertilized soils are low in organic matter. Organic matter helps conserve the soil and soil moisture, providing insurance against drought. Soils lacking organic matter are more vulnerable to drought and to climate change. Industrial agriculture is also more dependent on intensive irrigation. Since climate change is leading to the melting of glaciers that feed rivers, and in many regions of the world to the decline in precipitation and increased intensity of drought, the vulnerability of industrial agriculture will only increase. Finally, since the globalized food system is based on long-distance supply chains, it is vulnerable to breakdown in the context of extreme events of flooding, cyclones, and hurricanes. While aggravating climate change, fossil fuel-dependent industrialized, globalized agriculture is least able to adapt to the change.

We need an alternative. Biodiverse, organic farms and localized food systems offer us security in times of climate insecurity, while producing more food, producing better food, and creating more livelihoods. The industrialized, globalized food system is based on oil; biodiverse, organic, and local food systems are based on living soil. The industrialized system is based on creating waste and pollution; a living agriculture is based on no waste. The industrialized system is based on monocultures; sustainable systems are based on diversity.

Living Soil

Every step in building a living agriculture sustained by a living soil is a step toward both mitigating and adapting to climate change. Over the past 20 years, I have built Navdanya, India's biodiversity and organic-farming movement. We are increasingly realizing there is a convergence between the objectives of conserving biodiversity, reducing climate-change impact, and alleviating poverty.

Biodiverse, local, organic systems reduce water use and risks of crop failure due to climate change. Increasing the biodiversity of farming systems can reduce vulnerability to drought. Millet, which is far more nutritious than rice and wheat, uses only 200 to 300 millimeters of water, compared with the 2,500 millimeters needed for Green Revolution rice farming. India could grow four times the amount food it does now if it were to cultivate millet more widely. However, global trade is pushing agriculture toward GM monocultures of corn, soy, canola, and cotton, worsening the climate crisis.

Biodiversity offers resilience to recover from climate disasters. After the Orissa supercyclone of 1998, and the tsunami of 2004, Navdanya distributed seeds of saline-resistant rice varieties as "Seeds of Hope" to rejuvenate agriculture in lands that were salinated as a result of flooding from the sea. We are now creating seed banks of drought-resistant, flood-resistant, and saline-resistant seed varieties to respond to such extreme climate events. Climate chaos creates uncertainty. Diversity offers a cushion against both climate extremes and climate uncertainty. We need to move from the myopic obsession with monocultures and centralization to diversity and decentralization.

Diversity and decentralization are the dual principles needed to build economies beyond oil and to deal with the climate vulnerability that is the legacy of the age of oil. In addition to reducing vulnerability and increasing resilience, biodiverse organic farming also produces more food and higher incomes. As David

Pimentel has pointed out: "Organic farming approaches for maize and beans in the US not only use an average of 30% less fossil energy but also conserve more water in the soil, induce less erosion, maintain soil quality, and conserve more biological resources than conventional farming does."

After Hurricane Mitch struck Central America in 1998, farmers who practiced biodiverse organic farming found they had suffered less damage than those who practiced chemical agriculture. The ecologically farmed plots had on average more topsoil, greater soil moisture, and less erosion, and the farmers experienced less severe economic losses.

Fossil fuel-based industrial agriculture moves carbon from the soil to the atmosphere. Ecological agriculture takes carbon from the atmosphere and puts it back in the soil. If 10,000 medium-sized US farms converted to organic farming, the emissions reduction would be equivalent to removing over 1 million cars from the road. If all US croplands became organic it would increase soil-carbon storage by 367 million tons and would cut nitrogen oxide emissions dramatically. Organic agriculture contributes directly and indirectly to reducing CO2 emissions and mitigating the negative consequences of climate change.

Navdanya's work over the past 20 years has shown that we can grow more food and provide higher incomes to farmers without destroying the environment and killing peasants. We can lower the costs of production while increasing output. We have done this successfully on thousands of farms and have created a fair, just, and sustainable economy. The epidemic of farmer suicides in India is concentrated in regions where chemical intensification has increased costs of production. Farmers in these regions have become dependent on non-renewable seeds, and monoculture cash-crops are facing a decline in prices

due to globalization. This is affecting farmers' incomes, leading to debt and suicides. High costs of production are the most significant reason for rural indebtedness.

Biodiverse organic farming creates a debt-free, suicide-free, productive alternative to industrialized corporate agriculture and brings about a number of benefits. It leads to increased farm productivity and farm incomes, while lowering costs of production. Pesticide-free and chemical-free production and processing bring safe and healthy food to consumers. We must protect the environment, farmers' livelihoods, public health, and people's right to food.

We do not need to go the Monsanto way. We can go the Navdanya way. We do not need to end up in food dictatorship and food slavery. We can create our food freedom. Biodiverse, organic, and local food systems help mitigate climate change by lowering greenhouse gas emissions and increasing absorption of CO2 by plants and by the soil.

Organic farming is based on the recycling of organic matter; industrial agriculture is based on chemical fertilizers that emit nitrous oxides. Industrial agriculture dispossesses small farmers and converts small farms to large holdings that need mechanization, which further contributes to CO2 emissions. Small, biodiverse, organic farms, especially in third world countries, can be totally fossil fuel-free. The energy for farming operations comes from animals.

Soil fertility is built by recycling organic matter to feed soil organisms. This reduces greenhouse gas emissions. Biodiverse systems are also more resilient to droughts and floods because they have a higher water-holding capacity, making them more adaptable to the effects of climate change. Navdanya's study

on climate change and organic farming has indicated that organic farming increases carbon absorption by up to 55 percent and water-holding capacity by 10 percent.

The environmental advantages of small-scale, biodiverse organic farms do not come at the expense of food security. Biodiverse organic farms produce more food and higher incomes than industrial monocultures. Mitigating climate change, conserving biodiversity, and increasing food security go hand in hand.

The conventional measures of productivity focus on labor as the major input (and the direct labor on the farm at that) and externalize many energy and resource inputs. This biased productivity pushes farmers off the land and replaces them with chemicals and machines, which in turn contribute to greenhouse gases and climate change. Further, industrial agriculture focuses on producing a single crop that can be globally traded as a commodity. The focus on "yield" of individual commodities creates what I have called a "monoculture of the mind." The promotion of so-called high-yielding varieties leads to the displacement of biodiversity. It also destroys the ecological functions of biodiversity. The loss of diverse outputs is never taken into account by the one-dimensional calculus of productivity.

When the benefits of biodiversity are taken into account, biodiverse systems have higher output than monocultures. And organic farming is more beneficial for the farmers and the earth than chemical farming. When agro-forestry is included in farming systems, carbon absorption and carbon return increase dramatically. Date palm and neem increase the carbon density in the soil by 175 and 185 percent, respectively.

Studies carried out by the USDA's National Agroforestry Center suggest that soil carbon can be increased by 6.6 tons per hectare per year over a 15-year rotation and wood by 12.22 tons per hectare per year. Since both soil and biomass sequester carbon, this amounts to removing 18.87 tons of carbon per hectare per year from the atmosphere.

Soil and vegetation are our biggest carbon sinks. Industrial agriculture destroys both. By disrupting the cycle of returning organic matter to the soil, chemical agriculture depletes the soil carbon. Mechanization forces the cutting down of trees and hedgerows.

Organic manure is food for the community of living beings that depend on the soil. The alternatives to chemical fertilizers are many: green manures such as sesbania aculeata (dhencha), gliricidia, and sun hemp; legume crops such as pulses, which fix nitrogen through legume-rhizobium symbiosis; earthworms; cow dung; and composts. Farmyard manure encourages the buildup of earthworms by increasing their food supply. Soils treated with farmyard manure have from two to two and a half times as many earthworms as untreated soils. Earthworms contribute to soil fertility by maintaining soil structure, aeration, and drainage. They break down organic matter and incorporate it into the soil.

The work of earthworms in soil formation was Darwin's major concern in his later years. Of worms he wrote, "It may be doubted whether there are many other animals which have played so important a part in the history of creatures." The little earthworm working invisibly in the soil is the tractor, the fertilizer factory, and the dam combined. Worm-worked soils are more water-stable than unworked soils, and worm-inhabited soils have considerably more organic carbon and nitrogen than the original soil. Their

continuous movement forms channels that help in soil aeration. It is estimated that they increase the air volume of soil by up to 30 percent.

Soils with earthworms drain four to ten times faster than those without, and their water-holding capacity is higher by 20 percent. Earthworm castings, which can amount to 4 to 36 tons per acre per year, contain five times more nitrogen, seven times more phosphorus, three times more exchangeable magnesium, 11 times more potash, and one and a half times more calcium than soil. Their work on the soil promotes the microbial activity essential to the fertility of most soils.

At the Navdanya farm in Doon Valley, we have been feeding the soil organisms. They in turn feed us. We have been building soil and rejuvenating its life. The clay component on our farm is 41 percent higher than those of neighboring chemical farms, which indicates a higher water-holding capacity. There is 124 percent more organic-matter content in the soil on our farm than in soil samples from chemical farms. The nitrogen concentration is 85 percent higher, the phosphorus content 10 percent higher, and the available potassium 25 percent higher.

Our farm is also much richer in soil organisms such as mycorrhiza, which are fungi that bring nutrients to plants. Mycorrhizal association makes food material from the soil available to the plant. Our crops have no diseases, our soils are resilient to drought, and our food is delicious, as any visitors to our farm can vouch. Our farm is fossil fuel-free. Oxen plow the land and fertilize it.

By banning fossil fuels on our farm we have gained real energy-the energy of the mycorrhiza and the earthworm, of the plants and animals, all nourished by the energy of the sun.

Activist and physicist Vandana Shiva is founder and director of the Research Foundation for Science,

Technology, and Natural Resource Policy in New Delhi. She is author of more than three hundred papers in leading journals and numerous books.

http://www.google.com/Top/Science/Agriculture/Sustainable_Agriculture/

- **Center for Agroecology and Sustainable Food Systems - http://casfs.ucsc.edu/**
  Organization dedicated to increasing ecological sustainability and social justice in the food and agriculture system. Situated at the University of California, Santa Cruz, it undertakes research, education and community outreach and runs an organic garden and farm.
- **University of California Sustainable Agriculture Research and Education Program - http://www.sarep.ucdavis.edu/**
  Searchable site with topics including "what is sustainable agriculture?", biologically integrated farming systems, cover crops, earthworms, soil quality, and sustainable agriculture courses, workshops, and events.
- **Sustainable Agriculture Network - http://www.sare.org/**
  Information on sustainable agriculture for producers. Grants available for sustainable agriculture projects.
- **Sustain: the Alliance for better food and farming - http://www.sustainweb.org/**
  Advocates food and agriculture policies and practices that enhance the health and welfare of people and animals, improve the working and living environment, promote equity and enrich society and culture.
- **ATTRA - National Sustainable Agriculture Information Service - http://www.attra.org/**
  A sustainable agriculture information center that provides technical assistance to farmers, market gardeners and extension agents on farming topics: sustainable, organic, alternative, crops, livestock, and pest control.

- **National Sustainable Agriculture Information Service - http://attra.ncat.org/**
  ATTRA provides an on-line resource for sustainable agriculture and organic farming news, publications, events and funding opportunities. Extensive library of articles and studies, with links to related sites.
- **The Rodale Institute - http://www.rodaleinstitute.org/**
  Details of research and promotion of sustainable farming practices.
- **Alternative Farming Systems Information Center - http://afsic.nal.usda.gov/**
  USDA, National Agricultural Library site about sustainable and organic food production systems and practices.
- **Bureau of Rural Sciences (BRS) - Australia - http://www.daff.gov.au/brs**
  Provides scientific advice for the sustainable development of Australia's agricultural, fisheries and forestry industries.
- **Sustainability Institute - http://www.sustainabilityinstitute.org/**
  Provides information on projects on sustainable food production and environmental issues, and offers courses, workshops and consultation services.
- **Leopold Center for Sustainable Agriculture - http://www.leopold.iastate.edu/**
  The center's objectives are to reduce negative impacts of agriculture on natural resources and rural communities, to develop profitable farming systems that conserve natural resources, and to inform the public of new research findings.
- **The Land Institute - http://www.landinstitute.org/**
  Aims to develop an agricultural system with the ecological stability of natural grasslands, as well as a high grain yield.

- **Sustainable Agriculture Coalition - http://sustainableagriculturecoalition.org/**
  National alliance of farm, rural development and conservation groups. Provides information on the organization, its work, publications, getting involved and the blog.
- **The National Campaign for Sustainable Agriculture - http://sustainableagriculture.net**
  Dedicated to educating the US public on the importance of a sustainable food and agriculture system that is economically viable, environmentally sound, socially just, and humane.
- **Roundtable on Sustainable Palm Oil - http://www.rspo.org/**
  International organization of producers, distributors, conservationists and other stakeholders. Includes details of current projects, and resources to download. Based in Switzerland and Malaysia.
- **Donald Danforth Plant Science Center - http://www.danforthcenter.org/**
  Mission is to increase understanding of plant biology; apply new knowledge to help sustain productivity in agriculture, forestry and allied fields; facilitate the rapid development and commercialization of promising technologies and products; contribute to the education and training of students, scientists and technicians from around the world.
- **Sustainable Agriculture: Information Access Tools - http://www.nal.usda.gov/afsic/pubs/agnic/susag.shtml**
  AFSIC's directory of contacts, research sources, databases, Web sites and educational programs related to sustainable agriculture.
- **What is Sustainable Agriculture? - http://www.sarep.ucdavis.edu/concept.htm**
  A detailed account of how sustainable agriculture integrates environmental health, economic profitability, and social and economic equity. From UC Davis.
- **Minnesota Institute for Sustainable Agriculture - http://www.misa.umn.edu/**

Partnership between the College of Agricultural, Food, and Environmental Sciences at the University of Minnesota and the Sustainers' Coalition. Cooperative effort to develop and promote sustainable agriculture.

Michael Fields Agricultural Institute - http://www.michaelfieldsaginst.org/
A research and education institute for biodynamic, sustainable, and organic agriculture. Staff directory, newsletter, reports, workshop schedule, and news.

Centre for Information on Low External Input and Sustainable Agriculture - http://www.leisa.info/
Aims for poverty alleviation through the promotion of agro-ecological approaches. Includes a collection of links, book reviews, and other information.

Tilth Producers - http://www.tilthproducers.org/
A Chapter of Washington Tilth Association, fosters and promotes ecologically sound sustainable agriculture in the interest of environmental preservation, human health and social equity.

Center for Integrated Agricultural Systems - http://www.cias.wisc.edu/
A sustainable agriculture research center at the University of Wisconsin. Details of research, local involvement.

Grace Factory Farm Project - http://www.factoryfarm.org/
Information, ideas, and strategies for activists opposed to factory farming. Topics cover the environmental, health, economic, social and animal welfare costs of large-scale animal production, as well as trends toward sustainable alternatives to factory farms.

CGIAR Systemwide Program on Participatory Research & Gender Analysis (PRGA) - http://www.prgaprogram.org/
Develops and promotes methods and organizational approaches for gender-sensitive participatory research on plant breeding and on management of crops and natural resources.

- **Long-Term Research on Agricultural Systems - http://ltras.ucdavis.edu/**
  Based at UC Davis, LTRAS is a long-term comparison of 10 conventional, organic and alternative cropping systems, both irrigated and nonirrigated.
- **Biodynamic Farming and Gardening Association - http://www.biodynamics.com/**
  U.S. non-profit organization formed to foster knowledge of biodynamic methods of agriculture, horticulture and forestry and undertake educational activities. Produces a journal and promotes CSA.
- **Protected Harvest - http://protectedharvest.org**
  Independently certifies and labels farmers' use of stringent environmental and sustainable growing standards.
- **Iowa State University - Sustainable Agriculture Extension Program - http://extension.agron.iastate.edu/sustag/**
  Provides information on events, research, education, links, funding sources, relevant to Iowa.
- **Small Farmer's Journal - Practical Horse Farming - http://www.smallfarmersjournal.com**
  A journal in support of independent family farmers. Offering information on the use of animal-power, organics and sustainable agriculture. Lynn Miller is editor and publisher
- **Agroecology - http://www.cnr.berkeley.edu/~agroeco3/**
  An explanation of the principles of sustainable farming, the ways in which resource use can be minimised, and local biodiversity preserved.
- **Washington Sustainable Food and Farming Network - http://www.wsffn.org/**
  A grassroots, statewide advocacy organization for sustainable agriculture and family farms in Washington State. Mission, programs, links.
- **The Beginning Farmer - http://thebeginningfarmer.blogspot.com/**

- **Blog about a novice farmer's experiences.**
- **Resilience in Prairie Agriculture - http://www.iisd.org/natres/agriculture/**
  Information on research into the challenges facing agriculture on the Canadian Prairies provided by the International Institute for Sustainable Development.
- **Regional Information Service Center for Southeast Asia on Appropriate Technology - http://www.ist.cmu.ac.th/riseat/index.php**
  Resource on appropriate technologies in the fields of sustainable agriculture, waste management, textiles and renewable energy, primarily in Cambodia, Laos, Thailand, Vietnam and Yunnan.
- **Grazing Management - An Ecological Perspective - http://cnrit.tamu.edu/rlem/textbook/textbook-fr.html**
  Publication edited by Rodney Heitschmidt and Jerry Stuth. Out of print.
- **Sustainable Agriculture Educational Project - http://www.msu.edu/user/dunnjef1/rd491/project.htm**
  Description on how to maintain soil fertility and how to reduce pH, soil erosion, pesticide use and salt levels. Links to other sustainable agriculture pages.
- **Sustainet - http://www.sustainet.org/**
  Cooperates with projects and organisations in Africa, Latin America and Asia that focus on sustainable agriculture and their wide-scale application.
- **Vineyard Agroecology - http://agroecology.berkeley.edu**
  Provides information about research being conducted by the Altieri Lab at UC Berkeley on the management of non-crop vegetation for the enhancement of natural pest regulation in vineyard agroecosystems.
- **Centre for Sustainable Agriculture - http://www.csa-india.org**

- **Organization that works with small and marginal farmers in India. Provides details of projects, sustainable technologies and major areas of work being undertaken.**
- **Center for Micro Eco-Farming - http://www.microecofarming.com**
  Promotes earth-regenerating and socially just mini-farming, with news, articles and resources for the micro eco-farming community.
- **Earthwise Resources Development Australasia - http://www.earthwise.org.au/**
  A demonstration site for sustainable agriculture. Details of the site, courses in permaculture, location.
- **The Contribution of Soil and Water Conservation to Sustainable Livelihoods in Semi-arid Areas of Sub-Saharan Africa - http://www.odi.org.uk/agren/papers/agrenpaper_102.pdf**
  Study discusses the positive influences and constraints for farmers to use soil and water conservation within Uganda and Tanzania.
- **Sustainable Animal Production: Workshops, Discussion, Resources - http://www.agriculture.de**
  Download the proceedings of a series of conferences (held October 1999 through October 2000) on future supply and quality of food for humans and animals, animal welfare and health, the effects of animal production on the environment, the influences of new technologies, future animal production sites and global trade.
- **Nature Farming Research & Development Foundation - http://www.nfrdf.com.pk**
  NFRDF is undertaking research into new sustainable technologies in the agro-industrial processes, livestock health and the reclamation and management of inferior soil and water resources.
- **Agtech Tours - http://www.agtechtours.com**
  Provides agricultural and horticultural technical tours in Spain for growers and food industry professionals from around the globe considering environmentally safe innovative crop production

and post harvest cultivation techniques through the use of new technology.

- Biologicals Report - http://www.pfi.iastate.edu/ofr/BIOLOGICALS_Report.htm
  A study to see, if using trace elements or microbes as replacements for chemicals in feed, pest control, and fertilizer would be financially profitable. Includes summary report. Some pages in PDF format only.
- Guelph Seminar Series in Agricultural and Rural Development - http://www.developmentseminars.org
  Communication and collaboration across disciplines and institutions on agricultural and rural development issues through remote international seminars involving researchers from Canada, Ghana, Kenya and Tanzania.
- Southern Africa Development Community: Agricultural Information Management Systems - http://aims.sadc.int
  Aims to provide planners and policy makers easy access to information necessary for revitalizing agricultural, enhancing food security and promoting rural development. Provides information on news, events, and programs for land, water, livestock, remote sensing and GIS.
- Allerton Research & Educational Trust - http://www.allertontrust.org.uk/
  Offers a practical demonstration of the integration of game and wildlife conservation with profitable farming.
- Allegiant: Sustainable Growth - http://www.goallegiant.com
  Group of multinational companies that conceives, designs and implements core technologies that result in sustainable economic development for emerging nations.
- Farmer Bert - http://www.farmerbert.com
  Blog by a farmer in Tennessee about his experiences of sustainable agriculture and taking care of

the land.

- **Sustainable Soil and Water Ltd - http://emsustains.co.uk**
  Provider of sustainable farming and environmental solutions using beneficial microorganisms that exist freely in nature.
- **Sustainable Nutrient Management in Agriculture - http://members.chello.nl/~a.hekstra2**
  Advisory software for consultants and extension workers to provide farmers with sustainable nutrition advice for their crops and cropping systems (organic and ecological farming).
- **Tarwyn Park - http://www.tarwynpark.com**
  Peter Andrews developed Natural Sequence Farming to regenerate the Bylong horse stud that was dry, barren, salty and eroded. Now Tarwyn Park is green, has water and is frost tolerant.
- **Centre for Sustainable Development Initiatives - http://www.csdikenya.org**
  The CSDI is a non-governmental organization dealing with sustainable natural resource development in the drylands of Kenya, concentrating on the three main themes of water, livelihoods and health.
- **Vanashree - http://www.vanashree.in**
  Provides information on this small farm in India including the low cost, organic and natural integrated farming methods used, the alternate energy utilization and the water conservation techniques.
- **Pistache Paulownia Project - http://www.paulownia.co.uk**
  This project aims to turn 4 acres of unused agricultural land in France into a sustainable Paulownia plantation.
- **Asian Rural Life Development Foundation - http://www2.mozcom.com/~arldf/**
  A training center for sustainable agriculture in the uplands, located in the southern Philippines.

Social Accountability in Sustainable Agriculture - **http://www.isealalliance.org/index.cfm?fuseaction=page.viewPage&pageID=504&parentID=500**
Describes objectives, which are to improve social auditing processes in agriculture. Also organisational details and partner information.

Applying the Principles of Sustainable Farming - http://attra.ncat.org/attra-pub/PDF/Transition.pdf
This publication discusses the principles of environmental, economic, and social sustainability, and provides practical examples of how to apply them on the farm.

Principles of Sustainable Weed Management for Croplands - http://attra.ncat.org/attra-pub/PDF/weed.pdf
This publication discusses several alternatives to conventional tillage systems, such as allelopathy, intercropping, crop rotations, and a weedfree cropping design and includes a list of further resources.

Cholderton Estate - http://www.sustainable-cholderton.co.uk/
An exercise in sustainable agriculture and farming in Hampshire, UK. Estate and family history, estate map, wildlife, crops, organic farming, livestock including Hampshire Down sheep, and Cleveland Bay horses.

Digital Green - http://research.microsoft.com/en-us/um/india/projects/digitalgreen/
A research project that uses participatory videos to promote sustainable agricultural practices in small and marginal farming communities.

GSC Sustainable Agriculture and Food Security Program in Tanzania - http://www.globalservicecorps.org/site/tanzania-agriculture-and-food/
Project for volunteers to participate in developing sustainable farming methods in Tanzania.

Adding Value to Farm Products - http://attra.ncat.org/attra-pub/PDF/valueovr.pdf
This article describes some different approaches to increasing the output from a farm in a sustainable way.

BEYOND ORGANIC By Eliot Coleman, printed in Mother Earth News

New ideas, especially those that directly challenge an established orthodoxy, follow a familiar path. First, the orthodoxy says the new idea is rubbish. Then the orthodoxy attempts to minimize the new idea's growing appeal. Finally, when the new idea proves unstoppable, the orthodoxy tries to claim the idea as its own. This is precisely the path organic food production has followed.

First, organic pioneers were ridiculed. Then, as evidence of the benefits of organic farming became more obvious to more people, mainstream chemical agriculture actively condemned organic ideas as unfeasible. Now that the food-buying public has become enthusiastic about organically grown foods, the food industry wants to take over. Toward that end the USDA-controlled national definition of "organic" is tailored to meet the marketing needs of organizations that have no connection to the agricultural integrity "organic" once represented. We now need to ask whether we want to be content with an "organic" food option that places the marketing concerns of corporate America ahead of nutrition, flavor and social benefits to consumers.

When I stated as an organic grower 35 years ago, it was a simpler world. Organic was a way of thinking rather than a "profit center." The decision to farm organically was a statement of faith in the wisdom of the natural world, to the quality of the crops and livestock, and to the nutritional benefits of properly cultivated food. It was obvious that good farming and exceptional food only resulted from the care and nurturing practiced by the good farmer.

The initial development of organic farming during the first half of the 20th century arose from the gut feelings of farmers who were trying to reconcile the biological truths they saw in their own fields with the chemical dogma the agricultural science-of-the-moment was teaching. The farmers came to very different conclusions from those of the academic agronomists. The farmers worked on developing agricultural practices that harmonized with the direction in which their "unscientific" conclusions were leading them. Their goals were to grow the most nutritious food possible, while protecting the soil for future generations.

The development and refinement of those biologically-based agricultural practices continues today. It's what makes this farming adventure so compelling. Each year I hope to do things better than I did last year because I will know Nature's systems better. But my delight in the intricacies of the natural world -- my adventure into an ever deeper appreciation of the soil-plant-animal nutrition cycle and how to optimize it -- is not acceptable to the homogenized mentality of mass marketing. The food giants that are taking over "organic" want a simplistic list of ingredients so they can do organic-by-the-numbers. They are derisive about what they label "belief systems" and they are loath to acknowledge that more farmer commitment is involved in producing real food than any number of approved inputs can encompass.

The transition of "organic" from small farm to big time is now upon us. Although getting toxic chemicals out of agriculture is an improvement we can all applaud, it only removes the negatives. The positive focus, enhancing the biological quality of the food produced, is nowhere to be seen. The new standards are based on what not to do rather than what to do. They will be administered through the USDA, whose director said recently, "Organic food does not mean it is superior, safer, or more healthy than

conventional food." Well, I still agree with the old time organic pioneers. I believe that properly grown food is superior, safer and healthier. I also believe national certification bureaucracies are only necessary when food is grown by strangers in far away places rather than by neighbors whom you know. I further believe good, fresh food, grown locally by committed growers is the very best to be found.
http://www.fourseasonfarm.com/main/authentic/beyond.html

The Bolivian School Making Agriculture Pay

Generating enough income from school business activities to provide a free education to your students is a tough challenge - but one which Colonia Piraí in Bolivia has more than conquered. What's more this school has achieved full financially self-sufficient through agricultural activities alone!

The students come from poor rural backgrounds where typical family income is in the range of $200-$600 per year - for a household of up to 20 people! This makes the student's practical, 'learning by doing' education all the more crucial as they are quickly able to apply new farming techniques at home and help support their family while they study.

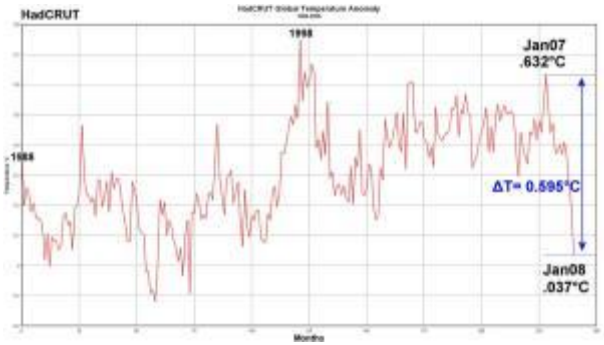
The school's two main income generating activities are the production of eggs and pork products, both of which operate on an industrial scale. These businesses provide employment for the local community, strengthen the school management's entrepreneurial credentials, and deepen the schools understanding of local markets - both as an employer and vendor.

At school, the students spend the morning getting hands-on experience in all aspects of agribusiness, enhanced by classroom theory in the afternoon.

Central to each student's education is an entrepreneurial community project which they set up and develop throughout their three years at Colonia Piraí. These projects spread new ideas and innovative agricultural techniques among local farmers and adding value to the local economy.

Each year graduating students take the skills they learnt at Colonia Piraí and set up their own agricultural enterprise or are employed in agribusiness as technicians and middle managers. Some even go on to further study at university - an incredible achievement when you consider that without Colonia Piraí they wouldn't have been able to even make it to high school!

Blog: Science Temperature Monitors Report Widescale Global Cooling
Michael Asher (Blog) - February 26, 2008 12:55 PM



World Temperatures according to the Hadley Center for Climate Prediction. Note the steep drop over the last year.

Twelve-month long drop in world temperatures wipes out a century of warming

Over the past year, anecdotal evidence for a cooling planet has exploded. China has its coldest winter in 100 years. Baghdad sees its first snow in all recorded history. North America has the most snowcover in 50 years, with places like Wisconsin the highest since record-keeping began. Record levels of Antarctic sea ice, record cold in Minnesota, Texas, Florida, Mexico, Australia, Iran, Greece, South Africa, Greenland, Argentina, Chile -- the list goes on and on.

No more than anecdotal evidence, to be sure. But now, that evidence has been supplanted by hard scientific fact. All four major global temperature tracking outlets (Hadley, NASA's GISS, UAH, RSS) have released updated data. All show that over the past year, global temperatures have dropped precipitously.

A compiled list of all the sources can be seen here. The total amount of cooling ranges from 0.65C up to 0.75C -- a value large enough to wipe out most of the warming recorded over the past 100 years. All in one year's time. For all four sources, it's the single fastest temperature change ever recorded, either up or down.

Scientists quoted in a past *DailyTech* article link the cooling to reduced solar activity which they claim is a much larger driver of climate change than man-made greenhouse gases. The dramatic cooling seen in just 12 months time seems to bear that out. While the data doesn't itself disprove that carbon dioxide is acting to warm the planet, it does demonstrate clearly that more powerful factors are now cooling it.

Let's hope those factors stop fast. Cold is more damaging than heat. The mean temperature of the planet is about 54 degrees. Humans -- and most of the crops and animals we depend on -- prefer a temperature closer to 70.

Historically, the warm periods such as the Medieval Climate Optimum were beneficial for civilization. Corres-ponding cooling events such as the Little Ice Age, though, were uniformly bad news.

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http://www.dailytech.com/Temperature+Monitors+Report+Widescale+Global+Cooling/article10866.htm

Science and Director of the Earth System Science Center at the University of Alabama in Huntsville, and Lead Author of the United Nations Intergovernmental Panel on Climate Change (IPCC). Ironically, the IPCC summary report was touted by the media as proof of a scientific consensus on this issue. Yet in the documentary, Christy states, "I've often heard it said that there is a consensus of thousands of scientists on the global warming issue, and that humans are causing a catastrophic change to the climate system. **Well I am one scientist—and there are many—that simply think that is not true**" (emp. added). Also highlighted is the testimony of Professor Fredrick Seitz, former President of the National Academy of Sciences. In a letter to the to the *Wall Street Journal*, Seitz said that IPCC officials censored the comments of scientists in the much ballyhooed IPCC summary report, omitting statements like this one: "No study to date has positively attributed all or part [of the climate change observed to date] to anthropogenic [man-made] causes."

In December of last year, over one hundred leading climatologists from around the world signed a letter to the Secretary General of the United Nations stating "significant new peer-reviewed research has cast even more doubt on the hypothesis of dangerous human-caused global warming." Even more recently, several hundred scientists met in New York for the 2008 International Conference on Climate Change to shed light on the global warming hysteria. The Conference pointed out that a 2003 study of climate scientists in 27 countries found that only fifty-six percent of them believed that humans are causing the Earth to warm, and even fewer believe we can accurately predict future climate conditions.

Despite this kind of evidence, because global warming is the cause célèbre of the liberal elite and the fashionable campaign of the glitterati, the mainstream media simply will not tell us that the emperor has no clothes. The media's failure to point out how widely disputed the man-made global warming model is in the scientific community can only be accounted for in terms of gross journalistic bias. They are happy to facilitate the current global warming alarmism because it fits with their secular worldview and supports a leftist agenda which, as surveys show, the majority of mainstream media journalists advocate.

What does this have to do with the creation-evolution debate? The same deception about consensus exists on the issue or origins. Most people believe the notion that all living things, including man, came into being gradually by purely natural processes over millions of years—loosely known as "evolution"—is a fact of science. The public accepts this uncritically because they have been told that's what all intelligent, informed people believe. For several generations, we have been conditioned to think that all scientists believe evolution is fact, and they do so because that is where the evidence has lead them. If that's what the scientists are saying, then why should we question it? "Everybody knows" we evolved, "right?"

Here again, the media bears a great deal of responsibility for helping to create and perpetuate a popular myth (ever heard of the "Scopes Monkey Trial"?). Historically, some of the greatest contributors to scientific progress have been creationists. Early on, Darwin's most pointed critics were paleontologists—not theologians. And presently there are numerous, reputable scientists and respected philosophers who do not accept the idea that the universe and all life within it could have come into being without a Designer (Creator), that natural process can account for the biological diversity and complexity, and that we are therefore merely products of time and chance. There is growing dissent from Darwinism by numerous scientific disciplines, including cosmology, physics and biology. Biochemist Michael Behe, retired Berkeley law professor Phillip E. Johnson, and even the renowned former atheist philosopher Antony Flew are just a few of the academicians who reject the idea that biological information could result from naturalistic processes. The Discovery Institute documents hundreds of scientists, including some from prestigious academies and universities around the world, who question the commitment of the mainstream science to atheistic materialism—which rejects any supernatural explanation for origins *a priori*—and are skeptical of the evolutionary explanation for the existence and structure of living organisms.

The media, however, continues to assure the public that there is no dispute among "real" scientists over the "fact" of evolution. Their misrepresentation of the issue is especially appalling when it comes to the controversy over whether Darwinism should be dogmatically taught to children in public school, or whether the alternative view of intelligent design or even scientific critiques of evolution should be permitted in the classroom. Listening to the mainstream media one gets the impression this is simply a matter of ignorant creationists trying to throw science out the window in order to brainwash our kids with their religion of literal, biblical creationism. When it is pointed out that some simply want the scientific facts—not scripture or religious arguments, but undisputed, observable data—contradicting evolution presented alongside the arguments for it, the media effectively tells us this is patently disingenuous, since we all know that no genuine scientist believes any such evidence against evolution exists. Their favorite way of dealing with the controversy is to tell us there is no controversy: evolution is a settled matter in the scientific community. **This is simply ignorant, dishonest, or both**.

It is naïve to think that journalists are never ideologues with an agenda, but always impartial observers, only objectively reporting facts. Their worldview—typically a secular one—colors what they see, and in turn, what they tell us (and do not tell us) about important issues of the day. They affect as much as reflect the public's perception of reality. We should realize that at times they are not so much telling us what is, but what they think should be, disguising opinion or propaganda as news. Their biased approach to the current global warming hoopla reveals how they mislead the public on evolution and other matters of profound importance. They have carefully hidden the disturbing truth that, just as with the politically correct agenda of global warming, the naturalistic view of origins is driven—not by sound science, but by secularist ideology. Thus it falls to those informed with the truth to take on the task of showing that what "everybody knows" is not really what everybody knows. ▲

It is unlikely the average American comprehends the degree to which the mainstream media shapes popular thinking on the crucial issues of our time.

Dirt Doctor Weekly Newsletter
Common Question: How to Control Rabbits, Moles & Deer?

Research done on agricultural crops in Amsterdam showed that plants sprayed with Tabasco sauce at 1 oz. per gallon of water was effective at repelling rabbits.

Here's one Dirt Doctor listener report: So far the Tabasco in water spray is working great at keeping the rabbits away. I was very skeptical, but by this time last year, the rabbits had completely destroyed my large vegetable garden and had eaten all my pansies. My garden looks gorgeous. The verdict is still out on how the veggies taste because nothing has been harvested yet. But it has definitely kept the rabbits at bay!

A commercial product for pest control that is available in stores is Rabbit Scram. Rather than a liquid spray, Rabbit Scram is a natural organic granular repellant that is effective and safe to use around children, pets and your vegetables. I'm very impressed that the owner of this company has applied a scientific approach to not only researching that the products work, but why they work as well.

Rabbit Scram is different because it is more than just an offensive scent or unpleasant taste to foraging rabbits. It is blended from selected organic and natural components and is sniffed off the ground by foraging rabbits before they enter the garden.

The product actually changes rabbit behavior. As they near the applied barrier, rabbits become alert to a sense of danger. Rabbit Scram's unique scent triggers a genetic biological defense mechanism to flee from predators.

Regular applications create a barrier 24 hours a day and won't wash off with rain as many spray repellents do.

As opposed to Tabasco sauce, Rabbit Scram is guaranteed to keep rabbits off your plantings. We are very happy to be working with this company. They also provide Mole Scram and Deer Scram that have the same scientific effectiveness.

GARDENS/MINI-FARMS NETWORK

USA: TX, MS; FL, CA, AR, NM, WA; México, Rep Dominicana, Cote d'Ivoire, Nigeria, Haití, Honduras, Kenya, Malawi, Mozambique, England, Nicaragua, India, Uzbekistan and www.nabuur.org

Workshops [urban & rural] in organic, no-till, permanent-bed, gardening, mini-farming, mini-ranching,
with bucket drip irrigation, worldwide, in English & Español

minifarms@gmail.com

Farmer Training

The farmers need help to reduce their labor, provide better food for better health and increase their income. This training helps people help themselves. Many are hungry and/or suffering from malnutrition and there is no excuse for that. 50% of the hungry people in the world are subsistence farmers. They have land, water and labor; all they need is knowledge. These practices stop the migration of farm families from rural areas to urban areas [Honduras]. Nothing else will. These practices make farming profitable. "There's this belief that in order to stop poverty, we have to find ways to get people to stop being farmers. What we need to do is find ways to stop them from being poor farmers." Amy Smith, MIT

Organic, no-till gardening/farming [hand tools only] in permanent beds doubles or triples yields, reduces labor by 50% or more, reduces inputs/expenses to nearly 0 [need seed for new crops and green manure/cover crops], increases fertility, stops soil erosion [no rain water runoff], eliminates most

disease and insect problems and greatly increases profits. Use bucket drip irrigation [made by gardener/farmer] to produce during the dry season and in areas of low rainfall.

Every farmer in the world should use the following. There is unlimited, documented proof it works.

A. No-outside inputs: You do not have to buy anything, at anytime, from anybody. [except seed?]

B. Organic: Organic restores/maintains a healthy soil. Healthy soil produces healthy plants, for high yields, for healthy people and solves most disease, pests and weed problems. Biochar destroys organic matter.

C. No-till: no plowing, no digging, no cultivating, no machinery: only planting and harvesting. After two or three years the yields can double while reducing the labor by half compared to traditional farming. One farmer can farm ten acres alone using hand tools only [Honduras].

D. Permanent beds: They were used 2000 BC in Guatemala, Mexico and other countries. Because 20% of the land is in permanent paths/tracks that saves 20% of the seed, fertilizer, irrigation water but yields will be higher.

E. Livestock: Raised using cut and carry or in pens over beds and/or rotational grazing.

No technique yet devised by mankind has been anywhere near as effective at halting soil erosion and making food production truly sustainable as no-tillage (Baker, 1996)

E. Bucket drip irrigation should be used to produce during the dry season and in areas of low rainfall: Bucket drip kits are US$25 or a bucket drip line made locally from poly tubing [US$3, Nicaragua]. It will irrigate a row of vegetables 33 meters long using only 20 liters of water per day. Water can be from a

stream, pond or well. Two lines will irrigate all the vegetables needed by a family of seven during the dry season [Kenya]. A drip returns $20 per month to the farmer [FAO study].

Hillsides: Can be used on steep hillsides which many subsistence farmers must use. In Honduras [Aug 99] I saw beds on 73º slope with no erosion from the flooding rains of Hurricane Mitch. No grasses, rocks or trees used.

Seeds for new crops: The farmers are more interested in this than anything I do. There is no profit in corn, rice, beans, coffee, pineapple or bananas except by alternative marketing. I take open pollinated seed.

Hand tools: The local blacksmith can make most of them.

Workshops are practical and how-to. I take reference books, videos, free magazines. I demonstrate drip irrigation, tools, make a no-till bed. Funds must be provided.

Ken Hargesheimer, I volunteer my time and all expenses must be covered. Scheduled: May, South Africa; October, Indonesia

I have often gone into villages where a child has died from dehydration caused by diarrhea, which was brought on by the bacteria and contaminants in the drinking water. I've watched as people march toward a graveyard. The leader, usually an uncle of the family, would be carrying a rag-wrapped body of a small child, while the rest of the family and friends follow behind crying and moaning over their loss. When they arrived at the site, they would quickly dig a shallow grave, carefully lay the body in it, then cover it over with dirt, then finish with a layer of heavy rocks. There would be no marker, other than the rocks, and soon the grave is unrecognizable. Another little soul lost to history, and this could easily have been prevented if fresh, clean water had been available.

This booklet will show you how to change this situation. You will be able to organize the villagers themselves to drill a well that will provide good, clean water, which will make their lives easier and healthier as a result.

It is our prayer you will use this information for the common good of the people you are working among. We also pray you will share it with as many as are interested, so more and more people might have access to good clean water.

This information can also help individuals to find a source of income. Natives can take what they learn, go from village to village and drill water wells for the people, and, for their expertise, charge them a nominal fee. By doing this, more and more families throughout the world can be helped in many ways.

Let us be eager to share and ready to do whatever it takes to make the world a better place than we found it. "As we have therefore opportunity, let us do good to all men, especially those of the household of faith." Remember, freely you have received, freely give.

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GARDENS/MINI-FARMS NETWORK

Workshops: USA - TX, MS, FL, CA, AR, NM, WA; México, Rep. Dominicana, Cote d'Ivoire, Nigeria, Honduras, Kenya, Malawi, Mozambique, Haití, England, Nicaragua, India

minifarms@gmail.com

Workshops in organic, no-till, permanent-bed gardening, mini-farming, mini-ranching, using drip irrigation, in English & Español

Excerpts From EAT FAT, LOSE FAT

1. You have heard that saturated fats are unhealthy; just the opposite is true.

2. The Dangers of Trans Fats; they actually *increase* cholesterol and also the risk of heart attacks.

3. Partially hydrogenated oil is a major cause of heart disease.

4. There is no evidence that a low-fat diet is more beneficial.

5. Many medical authorities still subscribe to false notion that saturated fats are bad.

6. An entire body of research implicates refined grains and sugars [especially high-fructose corn syrup] as the cause of obesity and heart disease.

7. Saturated fats actually protect us against heart disease and many other diseases.

8. There is documented evidence that the edible oil industry worked to influence government policy to endorse their products rather than traditional fats.

9. Myth # 1: High-Fat Food Causes Heart Disease.
Many studies have been carried out which refute this.

10. Myth #2: High Cholesterol Causes Heart Disease.
High levels of cholesterol in the blood causes heart disease is an axiom; there is much data refuting it which is misquoted.

11. Myth #3: High Fat Food Increases Blood Cholesterol.
Research completely oppose this idea.

12 Myth @4: Cholesterol Causes Plaque Buildup in Arteries.
Many studies contradict this. People eating animal fats actually had less heart disease than those who ate vegetable oil.
<u>The above are the greatest scam in the history of medicine.</u>

13 MSG: A Surprising Cause of Weight Gain [and worse]

It causes all sorts of neurological problems, the so called Chinese Restaurant Syndrome. It injures the hypothalamus which controls appetite. Nearly all processed foods contain it. If the label lists spices, flavorings, natural flavorings, citric acid or anything hydrolyzed or autolyzed, it probably contains MSG.

EAT FOOD FROM A FARM; NOT FROM A FACTORY!

Angela Balakrishnan
Saturday February 17, 2007
The Guardian

Situated on a bustling high street in southwest London, Farmers' City Market appears to be just another shop. The only clues to what may lie within are the two white statues of cows. A glimpse inside and it soon becomes clear that this is not your average store.

But nor is it your average farmers' market. This is a venture that aims to provide all the quality and reliably sourced food of other farmers' markets but without the draughty surroundings and temporary stalls. More ambitiously, the three founders, Jana Satchi, Stephen Wilkinson and George Beach, say they want to redefine food shopping.

"Jana and I were at Borough Market in London one day and it was freezing," says Wilkinson, a former food and wine buyer for Marks and Spencer. "It was at that point we thought: wouldn't it be great to do something like this but indoors?"

Their idea became reality just before Christmas when they opened their first store in Hampton Hill, Middlesex, in partnership with Beach, who is a fruit grower from Warwickshire. It is a move that reflects a trend in British food shopping towards fine foods and more interactive retailing. There are now some 550 farmers' markets across the country, the numbers having mushroomed since the first one opened in Bath in 1997. It is estimated that around 20 million people spend £2bn a year at the markets. A survey for the National Farmers Retail and Markets Association (Farma) showed that 30% of the population

would like to shop at a farmers' market or farmers' shop but only 11% do.

"There is still interest in setting up new farmers' markets - we see a strong wish from consumers to buy directly from producers," said Rita Exner of Farma. "There is a strong indication that as more of these outlets become available, more people will do this."

Supermarkets have responded too. Tesco's strong performance over Christmas was powered by a 39% increase in sales of organic produce. It reported that sales of organic turkeys doubled on the previous year. Sainsbury's has also seen a similar explosion in sales across the organic range. Asda has trebled its range of organic products.

Farmers' City Market's footfall reflects this growing phenomenon. The figures have been four times what the directors expected and already there are plans to open another five stores across the south-east by the end of the year.

Connecting

"Working in the textile industry, I saw there was this transparency in the retailing chain that I was dealing with," says Satchi. "I wanted to apply the same model to food. At the moment food retailing in Britain is all about buying products and selling them on at an added margin. It's so impersonal. We want to take retailing back to basics, a forum where people sell goods to each other - people who know what they are selling to people who want to buy."

However, you won't often find farmers behind stalls at FCM. The store is set out more like a conventional shop without individual counters or tills, although the produce is clearly labelled so shoppers can see where it was grown and by whom. The founders see themselves as connecting consumers to producers who often find it difficult to make time to sell their goods at markets and grow produce at the same time.

"Farmers' City Market is not a brand, it's a concept," Satchi says. "We don't want to overshadow our suppliers - it's important they retain their individuality. When they can, they pop into the store - it's great for them to meet and interact with the customers buying their produce. But most importantly they are at their farms doing what they do best."

There were four main elements of the traditional farmers' market that the trio thought they had to change. "Customers were wary of health and safety at some markets," says Wilkinson. "They didn't like having to pay cash and queue at each stall they visited. There were uncertainties over when the markets were open. And often people couldn't buy as much as they wanted because they had no way of carrying it all."

So at their Hampton store they are open seven days a week, have parking right outside the shop, recycled shopping bags, credit card payment and trolleys - with a smaller size just for children.

However, they are keen to stress their differences from supermarkets. "It's not what we sell, it's what we don't sell," says Beach. Nothing is packaged or manufactured. There is no bleach, toilet roll or microwave meals. But there is fresh food and lots of it. Ripe tomatoes in all shapes and sizes, cheeses

stacked high, earthy vegetables still with their roots and leaves, slabs of meats. The color and smells mingle to invite the customers to touch and taste.

There is also a large kitchen and restaurant, where Andrew Sargent makes meals from the produce. Demonstrations are given and warm trays of cakes and breads are brought out. "People thought we were mad to put a kitchen in the middle of the shop," says Wilkinson. "But it's all part of our ethos. We want you to enjoy your experience, be surprised."

Inundated

"We're not about buy one get one free," says Satchi. Their beef and milk, he says, is the same price as in many supermarkets, the difference being that at Farmers' City Market the customer can find out exactly who supplied it and where it came from. Furthermore, since emphasis is placed on sourcing goods locally and in season, it means the costs of getting produce to the store are lower.

The feedback is encouraging. A message board in the shop is inundated with messages from enthusiastic customers inquiring about new foods and requesting a store nearer to them. Kylie Odd is a frequent shopper. "I would go out of my way to come here," she says. "I like good-quality food and you get what you pay for." Whereas many dread visiting supermarkets with children in tow, Mrs. Odd is happy to bring her four-year-old son Louis. "He loves having his own little trolley. It's just a much nicer experience."

FCM have not launched an advertising campaign and prefer to "let the food do the talking". As another

customer leaves with several bags full, it appears that the food is doing just that.

Earth Policy Institute
Plan B 2.0 Book Byte
For Immediate Release
March 16, 2007

FARMING IN THE CITY Lester R. Brown

While attending a conference on the outskirts of Stockholm in the fall of 1974, I walked past a community garden near a high-rise apartment building. It was an idyllic Indian summer afternoon, with many people tending gardens a short walk from their residences. More than 30 years later I can still recall the setting because of the aura of contentment surrounding those working in their gardens. They were absorbed in producing not only vegetables, but in some cases flowers as well. I remember thinking, "This is the mark of a civilized society."

In June 2005, the U.N. Food and Agriculture Organization (FAO) reported that urban and peri-urban farms--those within or immediately adjacent to a city--supply food to some 700 million urban residents worldwide. These are mostly small plots--vacant lots, yards, even rooftops.

Within and near the city of Dar es Salaam, capital of Tanzania, there are some 650 hectares of land producing vegetables. This land supplies not only the city's fresh produce but a livelihood for 4,000 farmers who intensively farm their small plots year-round. On the far side of the continent, an FAO project has urban residents in Dakar, Senegal, producing up to 30 kilograms of tomatoes per square meter each year with continuous cropping in rooftop gardens.

In Hanoi, 80 percent of the fresh vegetables come from farms in and immediately adjacent to the city. These urban farms also produce 50 percent of the pork and the poultry consumed in the city. Half of the city's freshwater fish are produced by enterprising urban fish farmers. Some 40 percent of the egg supply is produced within the city or in its shadow. Urban farmers ingeniously recycle human and livestock waste to nourish plants and to fertilize fish ponds.

People living in wetlands in the region of East Calcutta in India manage wastewater fish ponds that cover nearly 3,500 hectares. Bacteria in the ponds break down the organic waste in the city's sewage. This, in turn, supports the rapid growth of algae that supply food for the various local strains of herbivorous fish. This system provides a steady supply of fish for the city, fish that are consistently of better quality than any entering the Calcutta market.

The magazine Urban Agriculture describes how Shanghai has in effect created a nutrient recycling zone around the city. The municipal government manages 300,000 hectares of farmland to recycle the city's night soil. Half of Shanghai's pork and poultry, 60 percent of its vegetables, and 90 percent of its milk and eggs come from the city and the immediately surrounding region.

In Caracas, Venezuela, a government-sponsored FAO-assisted project has created 4,000 microgardens of one square meter each in the city's barrios,
many of them located within a few steps of family kitchens. As soon as one crop is mature, it is harvested and immediately replaced with new seedlings. Each square meter, continuously cropped, can produce 330 heads of lettuce, 18 kilograms of tomatoes, or 16 kilograms of cabbage per year.

Venezuela's goal is to have 100,000 microgardens in the country's urban areas and 1,000 hectares of urban compost-based gardens nationwide. Leonardo Gil Mora, vice minister of integrated rural development, points out that "in the barrios as in Venezuela in general, people are the most important thing we have. Through urban agriculture, we hope to increase the poor's self-confidence, and so increase their participation in society."

There is a long tradition of community gardens in European cities. As a visitor flies into Paris, numerous community gardens can be seen on the outskirts of the city. These small plots produce not only high-quality food but a sense of well-being and community.

As a result of a national campaign in Cuba to expand urban farming after the loss of Soviet support more than a decade ago, Havana now produces half of the vegetables its residents consume. The city-state of Singapore has 10,000 urban farmers who produce four fifths of the poultry and a fourth of all the vegetables eaten there. A 2003 Urban Agriculture study reports that 14 percent of London's 7.6 million residents produce some of their own food. For Vancouver, Canada's largest west coast city, the comparable figure is an impressive 44 percent.

In the U.S. city of Philadelphia, community gardeners were asked why they gardened. Some 20 percent did it for recreational reasons, 19 percent said it improved their mental health, and 17 percent their physical health. Another 14 percent did it because they wanted the higher-quality fresh produce that a garden could provide, 10 percent did it for spiritual reasons, and 7 percent said it was mostly economic--cost and convenience. Urban gardens are social gathering places that engender a sense of community. In

addition, those who garden three to four times a week get the same physical benefits as people who engage in moderate walking or bicycling.

In some countries, such as the United States, there is a huge unrealized potential for urban gardening. A survey indicated that Chicago has 70,000 vacant lots, and Philadelphia, 31,000. Nationwide, vacant lots in cities would total in the hundreds of thousands. The Urban Agriculture report summarizes why urban agriculture is so desirable. It has "a regenerative effect…when vacant lots are transformed from eyesores--weedy, trash-ridden dangerous gathering places--into bountiful, beautiful, and safe gardens that feed people's bodies and souls."

Given the near inevitable rise in future oil prices, the economic benefits of expanding urban agriculture, even in affluent societies, will become much more obvious. Aside from supplying more fresh produce, it will help millions discover the social benefits and the psychological well-being that urban gardening can bring.

Adapted from Chapter 11, "Designing Sustainable Cities," in Lester R. Brown, Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble (New York: W.W. Norton & Company, 2006), available on-line at www.earthpolicy.org/Books/PB2/index.htm

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THEMATIC TEXTS

MODULE 5. SOLID WASTE MANAGEMENT AND URBAN AGRICULTURE

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BLOCK 4: GENDER, SOLID WASTE AND UPA

Gender and Development

Men and women play different roles in society, with their gender differences shaped by ideological, historical, religious, ethnic, economic and cultural determinants (Moser 1993).

Gendered Definition of Waste

The word "waste" refers to something that is "no longer serving a purpose", something "without value" (The Concise Oxford Dictionary). However, certain people in certain circumstances consider waste materials as a resource for their family, their livelihood, or their enterprise. So- called waste materials may serve as a crucial resource within households. For example, oily milk packages may be used as fuel; leftover food may be fed to pigs and goats; discarded cardboard may serve as walls and roofs of houses. If that is the case, one can expect that men and women re-value waste materials differently and see their usefulness for different purposes, such as domestic utility, saving on household expenditures, earning money, or other purposes. In short, there is a gendered definition of "waste" and of "resources", which must be reflected during any discussion of priorities regarding waste management in the

community consultation process (Muller Maria and Schienberg Anne www.gdrc.org). Knowing about gendered definitions of waste has a potentially large effect on the design of interventions for increasing source separation practice within the household or at the point of setout.

Community-Based Solid Waste Management

Neighbourhood associations and communities and small informal enterprises are increasingly involving themselves in the management of household waste, as citizens observe that too much garbage is lying uncollected in the streets, causing inconvenience and environmental pollution, and being a risk for public health for this reason. CBO are composed of various gender categories and hence offer a good sample for gender analysis.

Community-based waste management is seen as one of the components of urban waste management, in which neighbourhood communities, households, community based organisations and small, informal enterprises are engaged in collection and disposal, re-use and recycling of waste materials. Women and men, male youth, female youth, girls and boys are engaged in different waste- related activities, partly because of cultural traditions and conventions, partly because of practical interests, such as earning income and maintaining a healthy living environment. Such waste activities range from managing the resources within the household or family to the more formal municipal activities of collection. They include disposal, re-use and recycling; they comprise as well community decision making and management and the ways in which individuals, communities and governments arrange and negotiate the diverse interests of the public and private sectors (Schienberg et al., 1999).

Do Women and Men Risk, Do and Prefer Different Things?

How about disposal places and types of waste

Women and men (and also children) are almost certain to have different (and not always overlapping) knowledge of waste disposal places in their neighbourhoods. They may also have differing knowledge about different kinds of wastes. For example in Szentendre Island, in Hungary, a separate-sex mapping exercise resulted in the maps drawn by the men's group showing more sites with scrap metal from abandoned cars, tires and farm-equipment and more sites with building and construction wastes while those drawn by women showed more dumping places for household wastes and missed some of the sites mapped by the men. In this case, children were the only ones who seemed to know ALL the dumping-places, although they could not always say what kind of waste was found there. Urban Harvest and others in 2003 at Nairobi, Kenya, revealed that both men and women involved in waste management, are able to distinguish between organic and inorganic materials as opposed to results of a study of three communities in Kenya a decade earlier which indicated that women managing solid waste generally did not distinguish between organic and inorganic waste as quoted by Lee-Smith (June, 2003).

Who risks what?

Gender specific health risks of working with waste materials are not yet documented, but can be inferred. Data are available showing that people who have physical contact with human excreta or other raw waste materials contract diseases like hepatitis and diarrhoea and suffer eye and skin infections more frequently than people not so employed. The gender division of labour, therefore, will strongly influence men's and women's differential exposure to specific health risks, and how this affects the workers' children.

The case studies presented below are cited from an email conference on gender and waste which was carried out in 9-31 May, 1998.

In Ouagadougou (Burkina Faso), the community organisation at first only employed men, arguing that garbage collection was a 'typical' man's job. It was only when the high turnover of male collectors began to diminish the effectiveness of the collection service that the CBO agreed to employ women. It turned out that women were very reliable employees. These women, from situations of extreme poverty, were bent on doing good work, as they saw this as their only job opportunity, given their lack of employment skills, (UWEP case study, 1998).

From the perspective of women in Burkina Faso, employment in waste collection outside their neighbourhood was a new venture. They were prepared to breach customary bans on mobility and risk public harassment by working in public places likes streets, a typical male domain, because of unprecedented changes in their social-economic situation.

A different experience is reported from Dar es Salaam, where until 1998 six out of eight known waste CBOs were initiated and managed by women only. Although the management committee consisted of all

women volunteers, they employed both women and men as wage labourers for the garbage collection work, out of social concern for women's necessity to earn income. It is a development strategy that combines both environmental and social objectives. **(Muller, also WASTE ILO Mission)**

Another participant observed that in many Southeast Asian countries the women traditionally are responsible for the household waste and sweeping the streets and compound and take pride in keeping the environment clean and tidy. But as soon as any of these tasks become paying jobs, men are either targeted for the jobs for various reasons or end up dominating the structures and decision-making systems. The volunteer unpaid work of women at the household and community level ends up being on a lower status because it is taken for granted and not quantified. (Hayes)

At the beginning of a project in Recife, Pernambuco, Brazil, women wanted to participate. When it turned out to be a success regarding income generation and a better environment, men became interested in participating. Women in some locations were afraid men would take over and did not want their participation. But a division of labour between women and men and making clear the objectives of having both participating, seemed to have solved the problem. Men were given responsibilities in what they could do better, like carrying heavy loads. Women continue to do what they were good at: like separating solid waste in their homes. (Borba)

In Kenya, Urban Harvest and others in 2003, conducted a survey in Nairobi with an aim of understanding group dynamic in solid waste management. From the survey the observations made were that, out of 11 CBO,s managing waste and producing compost, 2 were youth groups (both male and female) and 9 were mixed groups (male adult, female adult, male youth and female youth). 4 groups had more females, 3

groups had more males, 2 groups had equal numbers 1 group was made up of females alone and another 1 was of males alone. It was also noted that, male youths had problems with adult females leadership, as they felt left out in financial management. The male youth also left the handling of waste to women and wanted only to be involved in book keeping and sale of compost. In mixed groups, the work of handling waste e.g. sorting and turning was women's job, while in youth groups male allowed females to do the less dirty jobs like watering. The main motivation for the involvement of both men and women in garbage collections and compost production is income generation. Where sales of compost were poor more men than women dropped out of the groups.

These case studies illustrate that men work when there is pay involved while women work for free.

Gendered Willingness and Ability to Pay and Services Preference

The point of departure here is that different cultures and societies assign the obligation to pay the bills for public services differently.

From your own background what are some of the household services that are paid by men and women

Type of service	Who pays for it

The way the culture assigns this obligation is both an empirical question and a very important piece of information when planning waste (and water and other public service) systems.

"An example from Bamako, Mali, illustrates the intra-household mechanisms of paying for garbage collection (told by a wise, old man in Bamako). Suppose the husband decides that the household should pay for garbage collection. Then there are several possibilities:
He pays for it himself.
He may tell his wife that she should pay from her own income e.g. from market trading.
He may tell his wife to pay, even if she has no independent source of income.
Another possibility is that the wife pays from her own income, although the husband has not given approval (in that case she is not only able to earn income, she also has the right to control expenditure). In this way intra-household gender relations may affect willingness to pay for a public garbage collection service." (Muller)

Calculations about ability to pay can not simply be based on objective data about household income level; they must also include an analysis of who controls the cash resource and how this is allocated.

Because of their status as household managers and their greater familiarity with the practicalities of (solid and human bodily) waste, women in positions of authority in community or city government may often exhibit different preferences for waste management strategies than their men counterparts. Some of the participants who are consultants noted that women city managers, mayors, or council-persons are often more interested in recycling and separation at source and understand better what its

consequences are, whereas men in these positions tend to imagine that it involves (their wives) actually shuffling through the garbage (Schienberg et al., 1999).

Why gender analysis in waste management

Gender analysis frameworks are concerned with:

Development context: What is getting better and what is getting worse?

Women's and men's activities, access to and control of resources and services: Who does what where and when do the activities take place, who has what, who uses what, who needs what, who makes decisions over what?

Knowledge. Women, men and youth may have knowledge about different things based on interest. E.g. waste types.

Gender analysis is aimed at gathering information that help in development of strategies that increase women's and men's participation in and benefits from projects.

Gender analysis of the definition of waste are useful in understanding the interface between personal and household management on the one hand and the community and public-sector cleansing activities, on the other hand.

Gender-sensitive approach can increase the effectiveness and efficiency of most waste management systems.

-For instance due to women's limitation in mobility and access to certain places due to insecurity, one need to get their views about location of a waste management project.

-Project aimed at source sorting would be successful if they targeted women and female youth (e.g. house help) as they manage waste at home.

-Awareness raising projects maybe more successful among the youth as they are more mobile, learned and easy to train. The youth may require support of village elders who can easily be listened to.

Gender issues affect the choice of projects. For instance if a choice by men and women were to be made between a road and waste system, women are more likely to choose the waste system project due to its relation with family health while men would choose the road project so that they could operate cars with less damage.

The following are some of the gender analysis tools:

a) Gender profile

Table 5.4.1

Activities, roles, preference	Access				Control (decision making)				Remarks
	MA	FA	MY	FY	MA	FA	MY	FY	
Composting: Waste sorting	X	√	X	√	√	√	X	√	Men say its a dirty job
Watering	X	√	X	√	√	√	√	X	

MA=male adult, FA female adult, MY=male youth and FA= female youth.

(b) Community mapping and transect walks

Different gender categories carry out mapping exercise or transect walks differently. This tool helps in illustrating gendered differences on knowledge, which may reflect, interest, access and/or control.

c) Focus group discussions

Separately group discussions are held among different gender categories such as children, male youth, female youth, male adult and female adult, so as to acquire each categories views. During these focus group discussions, different participatory tools can be used depending on the type of information required e.g. stakeholders analysis can be used to acquire information about different stakeholders, their activities, approaches etc.

Gender and project management

The effectiveness and sustainability of projects can be enhanced through addressing the following questions in project formulation

- **What about gender?**
- **Are there any gender interests or implications in the project**
- **Are there any roles differentiation based on gender?**
- **How will all gender categories be involved in the project management?**
- **How will the disadvantaged gender categories be encouraged to participate in the project?**
- **Are there any gender differences in knowledge?**
- **Are there any gendered differences in perceptions of the project within the community?**
- **Are there any gender differences in access and control of resources?**
- **What are the timings in execution of duties?**
- **What are the community costs involved and will all gender categories be able to meet this costs**

What strategies and methods can be applied to enhance gender incorporation in project management.

Table 5.4.2. Programme and project problems, which may indicate a need for gender analysis of the situation and a gender-sensitive approach to solving it

Symptom	Diagnosis and suggested approach
waste quantity estimates prove too low – there is more waste than predicted	The activities of the informal sector may not have been recorded and changes may have disrupted their functioning. Suggested approach is to use a broader definition of stakeholder and to solicit input from more parties, including women and men workers in the informal sector.
waste quantity estimates prove too high – there is less waste than predicted	Information may have been collected from one sex – probably men – when women have more accurate information
waste is improperly prepared	Check who the information has been delivered to: it may be that one sex has received it but the other sex is

	expected to do the work
waste is set out at the wrong times	**First, check again on information delivery. Second, ask women and men about their schedules. It may be that the collection schedule conflicts with key personal or professional activities, preventing cooperation even when people want to comply**
waste is set out in the wrong places	**The designated set-out sites may be culturally inappropriate in general, or inappropriate for the gender or class who set out the waste**
source separation protocols are not observed	**Those involved in handling waste at home – mainly women – may not have been consulted about their habits and preferences. More likely, they have been involved in the process of analysing how and at what point in the disposal process to introduce a separation step. The suggested approach is to invite women in small groups to analyse the situation and suggest changes that come from them, not from outside.**
litter baskets are not used and there is a concentration of litter in unwanted places	**The community has perhaps not been consulted about their ideas for the kind of litter baskets to use, where to place litter baskets, how to service them and how to publicise them. Consult groups of children, especially teenagers, women and men about their ideas.**

there is illegal dumping of a specific material or materials	**There may be no 'legal' or right option for dumping this material. Before introducing any kind of punitive approach, analyse the generation patterns for this material and identify the principal stakeholders who are responsible for generating and disposing of it. Then work with this group first to create a legal 'disposal opportunity' and/or 'recycling opportunity', combined with a gradual phase-in of strict enforcement and high fines.**
there is illegal dumping of unspecified materials	**Again, it is likely that the legal option is either too expensive, too inconvenient, inappropriate to the community, or otherwise indicative of something created without participation of the stakeholders. Suggested approach, as above, is first to analyse the generation patterns and especially whether the waste is 'gendered' or linked to some particular social or ethnic group and then to work first to create a legal 'disposal opportunity' or 'recycling opportunity', combined with a gradual phase-in of strict enforcement and high fines.**
there are low payment rates for waste services, combined with official or unofficial attempts to 'opt out' of the waste system	**Explore the dynamics of level of service, willingness to pay and ability to pay to see if there is a gender problem with the decisionmaking process that produced the current system. If so, begin with single-sex groups to sort out service preferences and willingness to pay.**

low payment rates for waste services, combined with continued illegal disposal	The information and education campaigns (iecs) in all probability do not address the priorities in waste management of the men and women residents. It is suggested to discuss the priorities of residents in small neighbourhood clusters and let this determine the flow of these campaigns. Mobilise influential women and men to organise waste management through the channels most likely to reach different groups of women, men and children

Source : Scheinberg, et al., (1999)

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1. Household Level: *Kumasi, Ghana*

Poverty, overcrowding, inadequate housing, and over-stretched infrastructure and services characterize many residential areas of Kumasi, Ghana. These problems are particularly common in the indigenous areas of the city (former villages now incorporated into the city due to urban expansion) where poor spatial planning and even lower service levels are found. In peri-urban areas located outside the municipal boundary these service pressures are often at the highest; inadequate and dilapidated public latrines, inadequate storm-water drainage, irregular water supply and open refuse dumps plague these areas. In addition, in these areas most households do not have toilet or piped water facilities, so residents are dependent on local public latrines and hand-pump wells for basic sanitary services.

In 2002/2003 as a component of a community waste management feasibility study, a survey of 323 households was undertaken in 6 different peri-urban locations of Kumasi. Despite differing social and economic circumstances amongst the six locations, several characteristics proved common in all six sites and were observed during the survey: unmanaged open waste dumps; indiscriminate dumping of waste on village peripheries; open defecation by children on waste dumps; and disposal of human excrement in plastic bags on waste dumps, the latter practice often called 'precious package', 'wrap and throw' or 'flying toilets'.

Results from the survey showed that in 76% of the households the waste was handled by women, while in 23% it was handled by the children (15 years and under), and in only one household did men handle the waste (that particular household consisted of only two males). In Ghana, household activities are clearly differentiated on a gender basis. The Urban Waste Expertise Programme (UWEP) identify that

women are far more likely than men to be involved in waste handling, cleaning up, or being associated with faecal waste, especially from children and older family members.

In Kumasi, every morning between the hours of 0500 and 0700 women (or children) from each household will systemically sweep inside their living quarters and also the compound or yard around their respective dwellings. The sweepings will be added to a basket or head-pan along with any domestic waste collected during the previous day and taken to the 'set-out point' (defined by UWEP as the 'point at which whatever has been defined as waste is placed outside of the household for handling by whomever or whatever institution is understood to be responsible for waste'.

In peri-urban Kumasi, where no waste collection services are provided, these set-out points are allocated sites where community members dispose of their domestic waste on ever accumulating open waste piles. These dumping sites are characterized by squalid and hazardous conditions and due to land shortage are often located within the community areas. In the indigenous areas of the city, accumulation of waste even occurs at sites where communal containers (skips) are provided for waste collection by the municipal authorities. Due to insufficient collection vehicles and waste containers, and delayed or even cancelled collection services many of the communal containers are permanently full and at these locations waste is dumped next to the overflowing skips. Effects of urbanisation and modernisation are leading to both changes in waste streams and to higher waste flows, resulting in the growth of unsanitary conditions in many areas of the city.

2. Community Based Waste Management: *City Park Compost Project, Nairobi*

A scoping study was conducted in year 2003 by Urban Harvest and partners in the urban and peri urban Nairobi, to inventorise the existing composting groups, document composting methods and to characterise composts. Out of the 11 composting CBO's, 2 were found to be located and using market generated waste. One of these two is the City Park Environmental Compost Project, which is located at the City Park market in Parklands, Nairobi. This is the first market based composting group in Nairobi, which was started in 1993 with a membership of 7 men and 8 women with a purpose of income generation, support to destitute children and cleaning the market. This initiative was as a result of funds from the Asian Foundation who incidentary are supporting the vegetable market. The nuisance of market waste due to poor services by the Nairobi City council may have led to the choice of composting making project. Therefore, the Asian Foundation constructed the shade where waste sorting and composing takes place. The association is guided by a constitution that stipulates the rules and regulation upon the members for instance resource management (time, sale of compost and income, external support).

A case study on was done in January 2004, to establish the gender involvement in market waste composting processes. Since its inception, the women sorted the waste and took it to the shade while men arranged the composting heaps in layers, watered and turned once a week until it was mature. Sieving and packing including storage was done by the whole group. One man whose stall was closest to the compost store was allocated the duty of selling and kept the store keys. The cash obtained from the sales was handed to the cashier who is a lady for banking. Income accrued from the sale of compost was shared among the member at the end of the year. A misunderstanding arose in 2002 when the 4 men and the chairlady, took some compost to the Kenya Agricultural Show, made some sales and never remitted the money as agreed although they had been advanced per diem to cater for their sustenance

at show. This brought about suspicion in the group as those who didn't go to the show had high expectations in market opportunities and cash. This was followed by a quarrel between the elderly women and the show team leading to a retrogressive growth of this group which had a lot of potential!

Currently, the group is composed of 8 women, 40% of whom are over 65 years old. This has affected the composting process, since they are unable to perform the heavy duties that are crucial to production of good quality compost for instance collecting different types of organic materials (the group is using banana leaves), watering and turning regularly and packaging. The store keys are kept by one of the elderly ladies who opens the store twice a week, sells the compost herself and the money is shared amongst the four without banking at all! The group therefore does not have any record on quantities of compost produced or the income generated in the last 3 years..

Way forward

-Men developed a proposal and managed to get a donor who was willing to improve compost producing facilities i.e. installation of piped water, storage tank and purchase of an organic waste chopping machine. They would also prefer involvement of neutral persons to produce and manage compost production as a commercial enterprise. Women are opposed to this approach. *Why do you think they are?*

-Women have sworn that they will never work with those men again and continue to do all the work but they need some technical assistance.

3. Private Sector in Solid Waste Management: *Nairobi Solid Waste Management Associations (NASWAMA)*

NASWAMA is an association of groups and companies involved in commercial waste collection in the informal and formal settlements in Nairobi. Waste management by the private entrepreneurs involved in collection of waste from households, markets, hotels and industries and transporting it to the Dandora dump site. Infrastructure in the dumpsite are poorly maintained and/or managed by the NCC and hence these organizations have experienced a lot of frustrations in achieving their objectives due to breakdown of vehicles, mugging etc. Due to this they saw a need to get together so as to collectively address these constraints. Thus they organized a workshop that bore NASWAMA in 1990. NASWAMA has a membership of approximately 86 organizations which include, 27 CBOs, 6 NGOs and 36 private companies, 2 societies and 18 research and development institutions. Among the 37 companies only 16% are female headed.

An indepth study on gender analysis was carried out on Blue Bins which is a male headed company. Out of a total of 18 employees only 1 is a female who does the secretarial duties. Three of the 17 workers are above 40 years old, while the rest young persons of less than 35 years in age. The three are drivers and mechanics while the rest do heavy duties of collecting and loading garbage into the vehicles. The management role is played by the owner of the company and his siblings, who at the inception stages of the company, they were very young (9-12 years old) but they contributed greatly to promotion and acquisition of clients. The founder of the company is planning to diversify his income generating activities and leave the total management of the company to the siblings who have matured with the organization.

Eighty percent of Blue Bins clients are women out of which 25% are the owners of homes and 75% are househelp. Where there is no househelp, the children collect and take household waste to designated collecting areas, a practice that is very prevalent in high density and the informal settlement areas. The rest of the clients comprised of bachelors most of whom have a personal relationship with the founder of the company. They have helped the founder with the establishment of the company and in getting him linkages with large-scale waste producers like hotels and industries.

Because of the poor and erratic garbage collection services from the NCC which led to uncontrolled dumping of garbage in the estates, a lot of residents were ready to pay for these services to any interested player and as such, there was no problem in payment. Infact most of the clients prefer paying in advance i.e. every 3 or 6 months or even yearly. The company does not experience any cash flow problems because there is a 95% compliant in payments.

THEMATIC TEXTS

MODULE 5. SOLID WASTE MANAGEMENT AND URBAN AGRICULTURE

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BLOCK 5. LEGAL INSTITUTIONAL AND POLICY ASPECTS OF SOLID WASTE MANAGEMENT AND UPA

Definition of waste management policy:
Policy should be regarded as the overall framework, philosophy or broad structure by which a government (or an establishment) intends to or does influence socio-economic activities or human behaviour to bring desired change. For most governments, laws have been used to achieve this objective for government policy. Laws themselves are made to reflect or shape society norms. A study by the ILO (1991) entitled "Government Policies and Urban and Informal Sectors in Africa" defined policy as a set of rules influencing how resources are allocated and who benefits from resource allocation. The Collins English Dictionary (Updated Edition) defines policy as a plan of action adopted or pursued by an individual, government party or business. An environmental policy can be understood as the set of government action and statements made by the use of instruments like action plans, management systems (institutions) and legislation (laws, by-laws, regulations) aiming at the improvement of the environment with a view to meeting sustainability objectives.

Within the policy management, policies have to be co-coordinated, reviewed, corrected and harmonized from time to time with other relevant policies. Policies have to be implemented by means of building necessary institutions, staffing, funding, etc.

Waste management policy is mostly a subset of environmental and health policies. In most African countries, these policies are scattered and incoherent set of laws and regulations on waste collection, treatment and disposal. There is no coherent, consistent and comprehensive set of laws and regulations on waste collection, treatment and disposal. This comprehensive waste management structure is desirable for sustainable waste management in all countries especially now when the resources available for service delivery is scarce rendering people to develop innovative ideas that are disjointed and requiring a direction. (*Examples will be given like the use of organic waste in agriculture*)

What should be a waste management policy?
A waste management policy should define waste, outline objectives, responsibilities, action plans that identify the right technologies. The policy should contain waste hierarchy of avoidance, minimize, recycle, treat and dispose. Operational standards should also be outlined for handling, storage, transportation and disposal. Polluter pays principle could be an area where governments could develop a policy for good practices to be adopted for community participation, which is very evident in Kenya as well as other Asian countries like India. In these countries communities and NGOs have taken the initiative to improve on the local sanitation of their neighborhoods and appropriate technologies have evolved and are being adopted in waste collection and recycling.

Policy Application

A policy statement may be applicable in its stated form or require the enactment of legislation in order to create institutions or regulate behaviour in a specific manner and enforce compliance.

The waste management sector will typically consist of: -

The policy and legislative system

The planning system for (waste amounts, infrastructure, location and operations), and

The Environmental Impact assessment system especially in the developed countries

What about urban agriculture, which is now rampant?

Policies are formulated targeting different levels in the society and with different objectives, e.g. at the international levels, regional, national, local and sectoral.

National policies are expected to stimulate economic activity and/or environmental action in the country at large. They are generally broad and supersede other lower level policies. They are usually made up of several operational components like monetary and fiscal amongst others. At the local level, has the interest of the urban poor been considered in policy development? Cases will be presented where urban agriculture is on going and what policies are in place to provide direction or are still the physical planners behind the activities happening in the urban set ups?

A Case Study Illustrating Policy and Institutional Aspects of Waste Management. ***The case of Kumasi Ghana***

Objective: To learn about strategies to integrate the re-use of municipal waste into urban environmental management. To learn in particular about stakeholder analysis, policy framework and institutional linkages necessary to ensure sustainability of recycling waste for urban and peri-urban agriculture (UPA).

Background

Though composting seems an attractive option from many angles, projects have been difficult to implement in many developing countries, especially in Africa. Through visiting composting projects in West Africa, it was observed that besides too expensive production, a common problem leading to project failure is poor co-ordination of efforts among institutions and stakeholders, due to weak institutional linkages, and the lack of the enabling institutional framework, including clear legislation and policies [1].

An investigation carried out by IWMI tried to:

analyse the existing legal and policy framework in addressing issues for composting in Ghana (via literature review, stakeholder interviews),

survey the perception of the institutions that can support community-based waste collection initiatives in Kumasi (via stakeholder analysis; perception interviews), and

propose an institutional linkage model suitable for Kumasi.

Existing policy framework (Case Kumasi)

Since 1999, the Environmental Sanitation Policy (ESP), drafted by the Government of Ghana, provides the national regulatory and institutional framework for all activities and actors involved in

Environmental Sanitation. The ESP covers relevant aspects such as the establishment of the roles and responsibilities to be played by the public sector, the private sector and the community; legislation and law enforcement; criteria for services and projects; funding; and specifications for equipment and supplies. It was drafted in the context of the implementation of the Urban Environmental and Sanitation Project (URBAN IV) of the World Bank, a project designed among others to address the privatisation of waste collection systems in the five major cities of Ghana and the implementation of sanitary landfills [2]. Although the project perceives composting as a good option for waste minimisation, URBAN IV does not yet include a section on composting. Another factor influencing the ESP is that previous Ghana's experiences on composting are usually associated with the Teshie-Nungua plant, a capital-intensive, mechanic-automated, centralised compost plant, financed by the Swiss Government in 1979. The plant was originally designed with a production capacity of 20 tons/hour (circa 38,000 tons per year), but due to inadequate electricity supply, lack of spare parts and inadequate maintenance programs, the plant broke constantly [3]. By the time of its opening, the project generated great expectation among municipal authorities, who estimated big revenues on compost sales. Failure brought disappointment, and consequently, the prevailing impression among municipal planners and policy makers that composting is not cost-effective. At present the plant is sub-utilised; it operates more as a dumpsite than as a compost plant. The compost produced is, however, in high demand by real state developers, who pick it up using their own transport, but farmers are unable to buy it because the majority lack means of transport.

Participation of NGOs and CBOs is encouraged in the ESP, but in practice lack of regulatory framework accounted for the temporary cessation of operations of a self-sustaining project in Jamestown in Accra,

(the Ashiedu Keteke Community Participation Project, AKCPP), when house-to-house waste collection service was duplicated with a private contractor who was paid per removed waste volume (City & Country Waste).

Though the ESP is the initial step to establish the enabling institutional framework for waste management initiatives, experiences show that amendments and revision of the policy are needed in order to pave the path for project sustainability. After a thorough analysis by IWMI, the following policy aspects were presented to be considered [1]:

There is the need to draft local by-laws for the regulation and evaluation of composting initiatives, in promoting "good practices" to improve waste management, such as source separation of waste, or penalties for public dumping.
As compost is an agricultural input, setting of quality standards and marketing strategies should be responsibility of the Ministry of Food and Agriculture. The policy may include this linkage to Agriculture.
The regulatory framework should include formal schemes (instrumented by contracts) for Small-Scale Community-Based (SS-CB) composting and house-to-house waste collection projects operated by Community Based Organisations (CBOs) and Non Governmental Organisations (NGOs).
In order to assess "net savings of the assembly" it would be necessary to compare net savings of compost production to land filling (considering all costs and externalities). These could be justified best in those peri-urban suburbs not connected to urban waste collection. Here composting would be closer to the farmers, offer local waste dumps a significant relief, and save municipal funds otherwise spent on waste transport.

Also, the "limited market for compost" mentioned by the ESP has not yet been estimated, a gap now closed by IWMI for at least three major cities and their peri-urban areas (see figure 5.1.1).

These points are currently under discussion in Kumasi by the Kumasi Metropolitan Assembly and other stakeholders like communities, donors, scientists, and NGOs.

Perception Analysis among institutions that can support community-based waste collection and composting initiatives in Kumasi

Composting of urban waste is an economic activity involving several interest groups; its effects fall into the scope of responsibility of many institutions. The following institutions were identified in a stakeholder analysis based on interviews with key resource persons and then selected for a survey on perception of compost and composting due to their potential role in the provision of sanitation services, extension of agricultural services, or as beneficiaries of both services [1]:

Kumasi Metropolitan Assembly-Waste Management Department (KMA-WMD). It carries out waste management through the Waste Management Department (WMD), provides licenses and supervision to operate waste management services to private companies, non-governmental organisations or community-based organisations.

Three suburb's Area Councils (AC) and one Unit-Committee (UC): Buokurom-Duase (AC and UC), Kwadaso (AC), Atonsu (AC). These are political-administrative units representing suburbs in the city. The

three face problems due to inefficient waste management; it is only in Atonsu that sanitary conditions are significantly better due to a waste collection program.
Environmental Protection Agency (EPA): The regulatory organism-institution responsible for the setting of standards and guidelines for environmental quality.
Ministry of Food and Agriculture (MOFA): Coordinates and regulates the utilization of agricultural inputs as well as provides assistance and extension of services to farmers.
Metropolitan Health Services (MHS): Provides health data, supports hygiene education activities, and contributes to regulation and standard setting. Data generated by this ministry is used for disease prevention and control.
Non-Governmental Organisations (NGOs): Ghana Organic Agricultural Network (GOAN), and GROWTH Development Projects. GOAN is an NGO with experience in extending training and information dissemination to small-scale farmers in organic farming and compost production. GROWTH Development Projects is an NGO with experience in composting projects and sanitation campaigns in urban areas of Accra.
Organic farmers association in Duase: An association of farmers trained by GOAN in organic farming methods.
Financial Institution: The World Bank, as an institution with wide capacity and experience supporting waste management initiatives in the country.

Elements of the institutional perception survey were: 1) positive aspects perceived in compost and composting; 2) negative aspects (or obstacles) in compost and composting project implementation; 3)

supportiveness and willingness to participate in the case a project were to be initiated; and 4) their role to play in such initiative in Kumasi. The results of the survey are synthesised as follows:

All of the institutions perceive compost and composting as a good agricultural input and as a good method for waste minimisation. Some of their particular views are: 1) it is environmentally friendly for the soil and the urban environment; 2) helps farmers to increase productivity; 3) crops are of better quality (in flavour and weight); 4) it opens the opportunity to create environmental and sanitation awareness; 5) it is an opportunity for municipal savings in waste collection and disposal.

Negative aspects and obstacles identified: 1) composting presents technical difficulties in project implementation; 2) to be effective, compost should be applied in large quantities to the soil (that is difficult); 3) prices of compost should be affordable by farmers, that is difficult due external costs (like transport costs) and low income of farmers; 4) projects are prompt fail if the institutional framework is not supportive; 5) in some low-income zones (Buokurom for example) a fee for waste collection would not be affordable; 6) low level of education was identified as the major obstacle making it difficult for people to understand the value of waste separation at the household level.

The institutions expressed positive their supportiveness and willingness to participate in the case a project were to be initiated. It was mentioned that in order to overcome obstacles, care must be observed in all planning stages so that all stakeholders' inputs are considered.

The survey revealed a constellation of stakeholders' roles to play in project implementation based on the expertise and abilities of each organisation (Figure 1). Considering that the majority of these institutions face sever resources constrains, lack of sufficient logistics, and general understaffing, but all of them see in composting an opportunity for improving the urban and peri-urban environment, their coordination and combination of resources, abilities, and strengths, represents institutional potentials to composting initiatives in Kumasi.

At the grassroots level, community representatives mentioned that people would be likely participate in waste collection if they were paid to do so; also, if two buckets were provided by the KMA or an NGO, people would separate their waste into organic and inorganic. They believe, because this is an opportunity to generate income and employment, that Village Chiefs would be supportive to facilitate land for the project.

The Organic Farmers' Association in Duase mentioned that even though they receive no support from superior levels to increase their productivity, they continue using and producing compost because their vegetables are of better quality, heavier, with better flavour, and are more nutritious; especially children like organic vegetables. They use their yields for self-consumption.

Institutional linkages to strengthen composting initiatives

Although abilities and expertise are available among institutions in Kumasi, weak inter-institutional linkages and lack of coordination can hamper effective implementation of plans and programs. From field visits to composting projects in four countries of West Africa [1], it was identified that successful projects are characterised by having strong inter-institutional linkages; this means, this projects have

formally established channels and procedures of cooperation and communication with the community, research institutions, funding organisations, the local government, village chiefs, and marketing channels (among others). On the other hand, it was identified that projects that have failed are characterised by having poor partnerships and weak or lacking institutional linkages. Through the comparison of projects it was concluded that the number, the quality, and the type of institutional linkages a project has, influence its sustainability.

Institution taking action

Activities proposed by the institutions					Activity
Quality control monitoring	CBO capacity building	Financial support of initiatives	Support Waste collection initiatives	Support sanitation awareness creation	
■			■	■	EPA
			■	■	MHS
■					MOFA
			■		KMA-WMD
					NGO GOAN
	■	■	■	■	NGO GROWTH
		■			WORLD BANK
			■	■	Village Chief
			■	■	Unit Committees
			■	■	Assemblyperson

	Monitoring & Evaluation of operation										
	Licensing operation										
	Monitoring Safety & environmental impact										
	Promotion of sales of compost										
	Coordination of stakeholders										
	Education of farmers										
	Facilitate land to site the plant										
	Involvement in Management										

Source: Vázquez, 2001 (modified)

Figure 5.1.1. Potential Institutional & Stakeholders' Support

One approach to characterise the relationship among different stakeholders in the recycling of municipal organic waste is based on the rural-urban nutrient cycle or loop. Besides its bio-technical aspect of materials recycling, this model represents the interactions between different social groups: 1) urban population, 2) waste collectors and compost producers, 3) farmers. This loop represents also an economy of scale through generation of income on each stage; positive generation of income becomes not only a cycle, but also a spiral of improved standard of living. In the centre of the cycle, the legal, institutional and communal settings may facilitate its social and economic aspects.

From the institutions listed in the perceptions survey, it is possible to group them into four general clusters: 1) Regulators: are institutions in power to draft by-laws, legal instruments, and policies; 2) Organisation & Management: institutions in charge of running composting plants; 3) Supporters of initiatives: institutions providing external support (financial, material, knowledge); 4) Beneficiaries: users of sanitation services (households and markets), communities and workers receiving income through composting (composting producers), and farmers (users of compost). Beneficiaries coincide with the groups representing each of the stages in the rural-urban nutrient cycle. Some of the institutions fall into more than one cluster; they are in the position to work as inter-cluster channels of linkage facilitating the flow and exchange of information. A model integrating the rural urban cycle and the clustering of institutions is proposed in Figure 5.5.2.

Fig: 5.52. Institutional platform supporting the rural-urban nutrient cycle

The institutional platform at the centre of the rural-urban nutrient cycle is to facilitate the framework of regulations, managerial and organisation skills, and external support to the beneficiaries. At the very

centre is the Kumasi Metropolitan Assembly (KMA), this institution plays a role as regulator, a manager, a supporter of initiatives and as a beneficiary due to municipal savings; its central role doesn't mean it should be the chief institution or the one in charge, but it should be the main facilitator. Bi-directional arrows link the cycle to the institutional platform, meaning that the relationship may not be characterised as patron-client relationship, but as a mutual benefit relationship.

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Goat Raising and the Enviroment

Northern Cebu and other areas in the country are sugar cane growers. Part of their traditional practice is burning the sugar cane fields after harvest. This allows them to turn around and plant again with minimal cost right away. The problem with this is it is damaging to the soil, air, micro organisms that help in the cycle of life, and contribute to global warming.

To sustain the damaged soil, the farmers pump chemical fertilzers to the ground. Again, such practices harm the soil further as well as the rivers, ocean, and drinking water supply. The cost of fertilizer (fossil oil based) is also growing which keeps growers from paying their workers adequate salary. Most workers get less than $2.00 a day for their hot and back breaking service in sugar cane plantations.

Goat raising can help overcome the environmental damage sugar cane industry causes. Farmers can raise nitrogen fixing plants for goat feed. Goat manure can be recycled back to the soil and bring back its original richness.

The financial benefit of goat raising for the poor farmers is also promising because goat meat is more expensive than beef or pork. Farmers can also milk their goats and sell their surplus or make soap or lotion. Goat manure is free fertilizer for their gardens.

If you wish to know more about goat raising as a means to empower the poor, especially children, please let me know. Feel free to pass this to others if you wish. Thank you.

Salvador Cariaga
cariaga@yahoo.com
PS. Currently, the Philippines import 90% of our milk and 80% of our beef products. The Philippines have enough land and natural resources to be exporting, not importing, such basic necessities.

How a Boer Goat is Changing a Community

Standard Boer goats are native to Africa. These goats can grow up to 280 pounds or more, and cost $600 (in Cebu) for a registered weanling. They usually have stocky white bodies and red heads. Although most Filipinos are familiar with goats, many have never seen a Boer goat. So when we decided to use goat raising as our flagship livelihood program, the people in the hills of Arapal (northern Cebu) shrugged it off. We were not the first livelihood project, or even the first goat raising program, they had encountered. The government had tried such offers in the past, and failed.

Determined to give it a go, the first thing I did was scout for all the homes that raise goats. There were quite a few. As many as one in five families have a goat or two, though mostly of the small, 20-40 pound native variety. They also do not milk their goats. I have traveled extensively around the island, and have yet to meet a family who milk their goats. So we conducted seminars on goat raising and milk production. We also lectured on organic alternatives and farming techniques, such as Vermiculture, Contour, and SALT Technology. We partnered with the government and feed companies on some of the seminars. As a matter of course, we also shared the Bible with these families, and invited them to church.

When it was time to disperse our small native goats, we had a few takers. We loaned most of our goats to children who were excited at the thought of having their own personal pet, and the parents and children signed a contract agreeing that the goat is actually loaned to the child. We then convinced a friend to donate money to buy an expensive Boer buck, and has been our most productive investment, both literally and figuratively.

In less than a year, the Boer has sired over 100 kids, and has changed the landscape of this community. Instead of the small native ruminants normally seen along Philippine roads, Boer hybrids are now popping up in this small village. People are lining up to borrow and raise a pregnant native goat mated by our buck. Early this week, a little old lady dragged her female goat (in heat) to the camp, insisting that the Boer sire her doe's offspring. Recently, 40 people attended a seminar to qualify for this goat-loaning program. They all want to have Boer kids. More are expected to join the next seminar.

The goats we disperse to poor children and farmers are usually pregnant when given. We divide their offspring, take our share, and pass these new additions on to others. We recently received another donation, with which we were able to purchase a new Boer buck. Deemed "Bubba" by his donors, Bubba the goat will sire the first Boer's female offspring, and improve (upgrade) their breed line even more. Another sign of progress:

our partnering farmers are now starting to milk their goats, and pretty soon will supply us with milk to market for them. We are also encouraging them to make good use of the goat manure for their gardens.

In the long run, we expect to see this community thrive economically, be healthy physically, and grow spiritually. With the food and fuel crisis looming on everyone's mind, our goat program offers hope for a better future. We calculate that if the children to whom we loan goats will take good care of half a dozen goats, it can pay for their education from grade school to college.

Thanks to the first Boer goat, the community visually witnesses the results, and are now buying into our mission and vision.

Salvador Cariaga
Filipino Goat Roper
Ps. If you wish to know more about our give-a-goat program, please write to cariaga@yahoo.com

Estrella is either a single mom or a widow. She does not talk or explain her situation much, but she has four kids. All four attend our VBS and other church activities regularly. One of them hangs around the farm and camp a lot.

Estrella built her goat house herself. She used the most basic materials she could gather for free. She does not have land, but uses a neighbors property to gather feeds for her goats. She is very dedicated to raising goats which we are excited about. We hope to give her and her kids enough goats that their living conditions will improve and will support her children's education all the way through college.

Building up a community, one family at a time....

PS. Attached picture taken yesterday. Native mother goat mated with our Boer. Result is an upgraded baby boers, which made Estrella and her kids very, very happy.

Below are some of publications available on the Beef/Dairy and Grassfed sections of the ATTRA website. http://www.attra.org/livestock.html#Beef

Beef Farm Sustainability Checksheet
- Full Version (16 pages)
- Short Version (4 pages)

Sustainable Beef Production

Dairy Farm Sustainability Checksheet

Dairy Beef

Grass-Based and Seasonal Dairying

The Economics of Grass-based Dairying

Raising Dairy Heifers on Pasture

Value-added Dairy Options

Beef Marketing Alternatives

Meeting the Nutritional Needs of Ruminants on Pasture

Grassfed info: http://www.attra.org/livestock.html#Grass

A Brief Overview of Nutrient Cycling in Pastures

Nutrient Cycling in Pastures

Assessing the Pasture Soil Resource

Dung Beetle Benefits in the Pasture Ecosystem

Grazing Networks for Livestock Producers

Grazing Contracts for Livestock

Matching Livestock and Forage Resources in Controlled Grazing

Managed Grazing in Riparian Areas

Multispecies Grazing

Rotational Grazing

Pastures: Sustainable Management

Converting Cropland to Perennial Grassland

Meeting the Nutritional Needs of Ruminants on Pasture

Greening the Desert

How Farmers in Sahel Confound Scientists

Scientists are catching up with farmers on how local knowledge and cooperation can work miracles. **Dr. Mae-Wan Ho** ***and Lim Li Ching***

A fully referenced version of this article is posted on ISIS members' website. Details here

Scientists catch up with reality

For years, many scientists have been making dire predictions of widespread irreversible 'desertification' in the African Sahel. But recent findings have proven them wrong.

Satellite images consistently show an increase in 'greenness' since the 1980s over large areas, confirming evidence on the ground indicating that the Sahel has recovered from the great droughts of the 1980s, and that human factors have played a large role in reclaiming the desert [1].

The African Sahel is a semi-arid grass and shrubland region situated between the Sahara desert in the north and the humid tropical savannas in the south, with a steep north-south gradient in mean annual rainfall. Rainfall is markedly seasonal and variable. A long dry season alternates with a short humid

season during the northern hemisphere summer. The scarcity of rainfall and its variable, unpredictable pattern accentuating from south to north, are the most important factors that shape the Sahel ecosystem. The vegetation cycle closely corresponds to the seasonality in rainfall, with virtually all the plant growth in the humid summer months. Overlying the sharp seasonal contrasts in rainfall are considerable fluctuations from year to year, and from one decade to another.

Although variable rainfall and droughts are seen as normal in arid and semiarid climates, the droughts that struck the Sahel in the late 1960s through to the 1980s were unprecedented in length and severity. Land degradation and famine during the droughts, exacerbated by political instability and unrest, prompted the UN to hold a conference on desertification in 1977. This initiated a debate, still ongoing, on the causes and effects of drought, land degradation and desertification.

There are two opposing camps in the debate. Adherents of the desertification hypothesis hold human activities responsible for 'irreversible' declines in vegetation from 'overuse of resources' and 'human mismanagement'. Skeptics, however, see declines in vegetation as the result of drought, and hence a temporary phenomena, with humans playing only a minor role, if at all.

Some scientists have stressed the high potential of adaptation of the Sahel population to rainfall variability, and they are right.

Greenness correlates with rainfall

Scientists at the University of Arizona Tucson, University of Maryland Baltimore and NASA Biospheric Sciences Branch Greenbelt in the United States investigated the spatial and temporal patterns of vegetation greenness and rainfall in the African Sahel. For rainfall, they used available meteorological data. For greenness, they used imaging data derived from measurements made by the Advanced Very High Resolution Radiometer instrument on board the National Oceanic and Atmospheric Administration polar-orbiting satellite series. The measure of greenness, Normalized Differential Vegetation Index (NDVI), is the normalized ratio of the near-infrared (NIR) and red spectral reflections:

NDVI = (NIR - red)/(NIR + red)

NDVI is sensitive to the presence, density and condition of vegetation and is correlated with the absorbed photosynthetically active radiation and growth in vegetation.

For the period 1982-2003, the overall trend in monthly maximum NDVI is positive over a large portion of the Sahel region, reaching up to 50 percent increase in the average NDVI in parts of Mali, Mauritania and Chad, though averages are not very meaningful in this highly dynamic environment with considerable seasonal fluctuations. This positive trend in NDVI is accompanied by widespread increases in rainfall over the same period of time, with maximum positive slopes in northern Nigeria.

However, from a longer-term perspective, the observed increase in rainfall is merely a return to more or less average conditions that prevailed before the 1960s after an exceptionally dry period, and does not suffice to cancel out the secular downward trend in rainfall across the entire region. The early to mid 1980s saw the peak of desiccation in the Sahel for the century.

Monthly maximum NDVI in the Sahel was found to correlate best with rainfall accumulated over a period 3 months (current plus previous 2 months), which confirmed earlier findings that vegetation greenness in semi-arid environments is more strongly related to soil moisture - a function of rainfall accumulated over a period of time - than to instantaneous rainfall. Correlation coefficients computed for NDVI and rainfall are highly significant for the entire Sahel region ($P<0.05$) with stronger correlations in the southern Sahel than in the north.

Greenness 'hotspots' correlate with human activity

When the main correlation of NDVI to rainfall is subtracted out, there is a residual pattern of NDVI in which large areas are without significant trends (over and above that predicted from the trends in rainfall), and considerable areas of positive residual trends, i.e., areas in which the vegetation has been greening more than explained by rainfall alone. These positive 'hotspots' are found in parts of Senegal, Mauritania, Mali, Niger, the Central Plateau of Burkina Faso and large portions of Chad.

While the greening in the Niger Delta of Mali might be explained by an expansion of irrigation, different explanations must be found for the Central Plateau of Burkina Faso, which had been identified as a prime example of the desertification crisis some 20 years ago. Here, a recovery of vegetation greenness beyond what would be expected from the recovery of rainfall alone might be due to increased investment and improvements in soil and water conservation technique such as contour bunding, in response to the drought crisis experienced by farmers [2].

In Niger, the greening hotspots were observed in Tahoua and Maradi regions, centring around the area of Projet Keita, an extensive rural development programme with a focus on natural resource management and soil and water conservation which began in the early 1980s supported by the FAO and the World Food Programme of the UN as well as the governments of Niger and Italy. Chris Reij, a soil conservationist who has worked in the region for decades, has independent corroborated the farmer-managed natural regeneration in this region of Niger, particularly along the road between Maradi and Dosso.

In Chad, the greening hotspot was found, among other places, in the Chari-Baguirmi region. The West African Pilot Pastoral Programme has managed a few sites there since 1994 to test a participatory approach to holistic rangeland management [3]. Pastoralists have evaluated the outcome as positive.

Areas showing negative trends in the NDVI residuals cover a considerably smaller area of the Sahel [1] and are clustered in northern Nigeria and Sudan, particularly in northern Nigeria. A hypothetical explanation may be human-induced land degradation due to civil strife and conflict. But overall, the 'negative' impacts of human activity are relatively insignificant.

More supporting satellite evidence

Another study of satellite images supported the notion that more plants make more rain [4, 5]. Evidence was found for a positive feedback between vegetation and rainfall at the monthly time scale, and for a vegetation memory operating at the annual time scale. That means greater greenness the previous month tends to increase rainfall a month later, and a green year tends to increase rainfall the next year, as greater plant growth and deeper root systems tap into more ground water for making rain.

This positive interaction between vegetation and rainfall increases the inter-annual variation in rainfall, accounting for as much as 30 percent of the variability in annual precipitation in some regions of the Sahel.

As a commentator stated [4]: "The result adds to the impetus to preserve green spaces in dry regions, in order to help prevent deserts from growing and encroaching on agricultural land."

Evidence emerging from the ground

Evidence of recovery has been coming from the ground since at least the beginning of the **present century. Fred Pearce reported in the New Scientist in 2001 on how in Nigeria, Niger, Senegal, Burkina Faso and Kenya, integrated farming, mixed cropping and traditional soil and water conservation methods have been increasing per capita food production several fold, keeping well ahead of population growth [5].**

The use of sheep manure for fertiliser gave increased yields for farmers in **Kano, Nigeria. Planting leguminous crops increased nutrient levels in the soil by fixing nitrogen from the air. Integration of crops and livestock enhances nutrient cycling; legumes and manure return to the soil what crops take out. The Kano region is the most agriculturally productive part of the country, with increased yields of sorghum, millet, cowpeas and groundnuts.**

A four-year study in eastern Burkina Faso challenged the assumption that land is degrading largely due to human activities [6]. It found that despite declining rainfall since the late 1950s and increasing populations, there was no evidence of land degradation connected to human activities nor a decline in food productivity. Conversely, yields of many crops have risen, and there was no decline of soil fertility over 30 years.

These farmers did not achieve environmental sustainability through a capital-intensive or high-tech path. In Burkina Faso, the increased yields of sorghum, millet and groundnuts could hardly be attributable to increased external inputs, because these crops received little fertilizer and were cultivated largely with a hand hoe.

The scientists found that farmers have a rich repertoire of soil and water conservation technologies, such as crop sequencing, crop rotation, fallowing, weeding, selective clearing, intercropping, appropriate crop and landrace selection, plant spacing, thinning, mulching, stubble grazing, weeding mounds, paddocking, household refuse application, manure application, crop residue application and compost pits. Mechanical practices include perennial grass strips, stone lines, wood barriers, earth barriers, brick barriers, stalk barriers, stone bunds, earth bunds and living hedges.

Perhaps more important than the practices is the selective way they are used, which vary with different field types, allowing optimal adjustment of limited labour and inputs to the requirements of different crops and soils. If land becomes limited, farmers do not need to invent new management systems; they apply these soil and water conservation practices *more intensively*. Farmers also apply land management practices only when and where needed. Using their knowledge of crops and soils, they treat only the parts of their field that need particular attention at any one time.

High local population densities, far from being a liability, are actually essential for providing the necessary labour to work the land, dig terraces and collect water in ponds for irrigation, and to control weeds, tend fields, feed animals and spread manure [5]. As population densities increase, farmers intensify their cooperation systems, grouping to tend each other's fields at busy periods, lending and borrowing land, livestock and equipment, and swapping seed varieties.

People thus invest heavily in creating and maintaining social networks that share land, labour, seeds, cattle grazing bushland, technologies and cash [6]. These networks enhance the ability of farmers to farm sustainably and efficiently by cooperation and reciprocity. They also allow people to diversify their livelihoods, learn from each other, and minimize risks, thus avoiding poverty traps.

Furthermore, in Maradi district of southern Niger, where repeated droughts have wrought environmental damage, farmers have reversed the damages and reclaimed the desert [5]. This was also true of Machakos (renamed Makueni) district of Kenya. In the 1930s, British colonial scientists had condemned the bare eroding hills of the drought-prone area to environmental oblivion; likewise the local Akamba people were seen as doomed to a miserable poverty-rife existence. The same narrative was consistently reproduced in the 1950s and 1970s. Yet researchers found the hills greener, less eroded and more productive than before, despite a fivefold population increase. The Akamba had responded to the droughts by switching from herding cattle to settled farming, giving them incentive to work the land effectively.

Niger a haven of trees

In Niger today, millions of trees are flourishing, thanks to poor local farmers. There are at least 3 million tree-covered hectares, not the result of the large-scale planting or other expensive methods often advocated by African politicians and aid groups, but by the efforts of individual farmers themselves. The area is far greener than it was 30 years ago; and these gains have come at a time when the population of Niger has exploded.

How did all this come about? Lydia Polgreen told the story in the *Herald Tribune* [7]. About 20 years ago, farmers like Ibrahim Danjimo realized something had to be done. "We look around, all the trees were far from the village," he said, "Suddenly, the trees were all gone.".

Danjima, now in his 40s, has been working the rocky, sandy soil of his tiny village since he was a child. He and other farmers in Guidan Bakoye took a small but radical step of not clearing the saplings from their fields before planting as they had for generations. Instead, they would protect and nurture the saplings, carefully ploughing around them when sowing millet, sorghum, peanuts and beans.

Another change was the way trees were regarded by law. From colonial times, all trees in Niger had been property of the state, which gave farmers little incentive to protect them, and they were chopped for firewood or construction.

Over time, farmers began to regard the trees in their fields as their property, and in recent years, the government has recognized the benefits and allowed individuals to own trees. Farmers make money off trees by selling branches, pods, fruit and bark.

Mahamane Larwanou, a forestry expert at the University of Niamey in Niger's capital, said the revival of trees had transformed rural life. Farmers can sell the branches for money, they can feed the pods as fodder to their animals, sell or eat the leaves and fruits. The tree roots fix the soil in place, preventing it from being carried off with the fierce Sahel winds. The roots also help hold water in the ground rather than letting it run off into gullies that flood villages and destroy crops.

Wrestling subsistence for 13 million people from Niger's fragile ecology is something akin to a puzzle." Larwanou said, "Less than 12 percent of the country's land can be cultivated, and much of that is densely populated. Yet 90 percent of Niger's people live off agriculture, cultivating a semiarid strip along the southern edge of the country."

Farmers practise mostly rain-fed agriculture. The return of trees increases the income of rural farmers, cushioning them against the boom and bust cycle of farming and herding.

Ibrahim Idy, a farmer in Dahirou, a village in the Zinder region, has 20 baobab trees in his fields. Selling the leaves and fruit beings him about $300 a year in additional income. He has used that to buy a

motorized pump that draws water from his well to irrigate his cabbage and lettuce fields, and sends his children to school. His neighbour, who has fewer baobab trees, cannot send his children to school; instead they have to draw water from the well. In some regions, swaths of land that had fallen out of use are being reclaimed with labour-intensive but inexpensive techniques.

In the village of Koloma Baba, in the Tahoua region just south of the desert's edge, a group of widows has reclaimed fields once thought forever barren. They dug pits in plots of land as hard as asphalt, placed a shovel of manure in each pit and wait for rain. The pits held the water and manure stayed in the soil and regenerated its fertility. In this way, more than 240 000 ha of land have been reclaimed, according to researchers. But it is still a hand to mouth existence, the women produce enough to eat, and disaster is always just one missed rainfall away.

While Niger's experience of greening on a vast scale is unique, smaller tracts of land have been revived in other countries. "It really requires the effort of the whole community," said Larwanou. "If farmer don't take action themselves and the community doesn't support it, farmer-managed regeneration cannot work."

Moussa Bara, the chief of Dansago, a village in the Aguié region where the regeneration has been a huge success, said the village had benefited enormously from the revival of trees. He said not a single child

had died of malnutrition in the hunger crisis that gripped niger in 2005, largely because of extra income from selling firewood. Still, he said, the village has too many mouths to feed.

Project Oasis must remain farmer-led

Chris Reij, now at the Free University Amsterdam in the Netherlands, presented the findings in Niger at the From Desert to Oasis symposium in Niamey. He wants to spread the success of Niger to neighbouring countries including Mali, Senegal and Burkina Faso. The programme will form part of the Oasis initiative to reclaim deserts, which was launched at the symposium in October 2006 by 11 African countries, with support from international research and government agencies [8].

Let's hope they will continue to let local farmers lead the projects, with scientists taking a supporting role. As Fred Pearce stressed of the Sahel miracle [5], "This is no high-tech breakthrough, nor a result of Western aid programmes." A major reason for the overestimation of land degradation is the underestimation of local farmers' abilities [6]. Scientists, policy-makers and aid workers must recognize the overriding importance of local knowledge and ingenuity for innovation, as well as the cooperative community networks for solving our problems of survival in times of climate change.

The greening of Sahel is a clear example of how the dominant Western knowledge system had grossly misinformed policy-makers; and it was the knowledge and initiatives of local farmers that saved the situation.

GARDENS/MINI-FARMS NETWORK

USA, México, Rep Dominicana, Cote d'Ivoire, Nigeria, Haití, Honduras,
Kenya, Malawi, Mozambique, England, Nicaragua, India, Uzbekistan, South Africa

Workshops [urban & rural] in organic, no-till, permanent-bed, gardening, mini-farming, mini-ranching,
with bucket drip irrigation, worldwide, in English & Español

Bucket Drip Irrigation

The bucket must be suspended at least l meter above the ground. A tube is connected to the dripline and the other end is placed in the bucket to siphon the water out. Assuming the bucket is 20 liters, fill it twice for each row of vegetables every other day. The dripline can be moved to another row for irrigating. Plant a row of vegetables on each side of the dripline and use 40 liters of water. One bucket, used 2-3 times per day, will grow all the vegetables a family can eat.

Bucket Kits

The key to the simple drip irrigation system that we use is the gravity fed "bucket kit". The bucket kit consists of four 8m lines [or two of 50 ft or one of 100'] of drip tape connected to a bucket suspended 1m above the vegetable bed. Water is poured into the bucket and is evenly distributed to 100 watering points. By filling the bucket twice a day, a small kitchen garden can be watered. Studies in Kenya have shown that two of these kits can provide the water needed to produce enough vegetables to feed a family of seven during the dry season. These bucket kits are available in most countries (US$25), save water, save labor, and are easy to use. Go to Chapinlivingwaters.org.

Using sleeves

Farmers in Honduras invented a VERY cheap drip irrigation system. They buy the regular black poly hose. Then they punch holes in it where they want them with a nail or ice pick. A hot nail is best. Then take short sections [5 inches] of the same hose, cut it lengthwise to form a sleeve, and place a sleeve over each hole. This sleeve applies pressure to the hole, only letting a little water out, like a drip. This technology is quite cheap, VERY simple to do. Maintenance is also simple, because if a hole plugs up, you can often unplug it merely by taking the sleeve off and then cleaning out the hole.

Using screws

Farmers in Nicaragua are using cheap round tubing and wood screws. I tried it with great success. The screw is inserted completely into the tubing, every 12 inches, so that it protrudes through the opposite side. It is then backed off to allow water to drip through that side. The flow is set by screwing it in or out as needed. This even allows for variations in pressure due to terrain. Hole can be cleaned out.

Pin holes for drip

I am wondering if a dripline could be made by using a hot pin or very small hot nail, etc. to punch holes in the poly tubing. I mean really tiny holes every 12 inches.

Irrigating one plant

Drill one hole in the bottom side of a bucket. It should be the same size as a short hose which is then inserted into the hole. Place the end of the hose at the base of a plant. Even better is to use a short piece of hose with several holes and circle the plant.

DIY drip kit:

Roger Pigott [San Diego workshop] decided to use two bucket drip systems on a bed in the garden but he did not want to siphon the water. Kits from Echonet.org are $25 each. He went to the hardware store and purchased: 100' of ½" black poly tubing; a post to hang buckets on; a faucet rosette washer and nut; ¾" ring washers; ¾" swivel tubing adapter; union - ¾" pipe threads and garden hose threads. One for each bucket. He drilled a 3/4 inch hole in the bottom of the buckets and installed the fittings. He then connected the tubing from the buckets to a header. He has five driplines connected to the header using tees and ells. He used wood screws for the drip outlets. There is about 60' of dripline. He planted seed in the five rows and laid the dripline over the seed. Very original thinking!

Buy enough hose to connect the drip line to the top of the bucket to siphon out the water. It takes about 1-2 hours for the bucket to empty. The dripline can be moved to another row of vegetables or plant a row of vegetables on each side of the dripline. Use more water. If one is willing to carry the water, one line will irrigate several rows during the day.

Best irrigation system with pressure

Best drip lines for irrigation using pressure. Purchase 1/8 inch or 1/4 inch polyethylene tubing. Connect to a faucet and run to the plants to be irrigated. For outlets, use a transfer barb or a tee. These do not stop up. Move to irrigate various areas.

Organic, no-till mini-farming, in permanent beds, using hand tools [& hand power tools], takes very little funds, increases yields, reduces labor by 50% to 75%, reduces inputs/expenses to nearly 0 [seed only], increases fertility, stops soil erosion [no rain water run off], eliminates most weed, disease and insect problems and greatly increases profits if marketing. Drip or DIY drip or DIY bucket drip irrigation as needed.

I teach workshops/training, worldwide, English or Spanish, free when expenses are paid.

Ken Hargesheimer
minifarms@gmail.com

The man who farms water

by Brad Lancaster

[ALN Editor's note: This article was originally published in the April 1996 issue of the Permaculture Drylands Journal (PDJ), and was reprinted in PDJ in summer 1998 as part of their "the first ten years" issue. PDJ is a publication of the Permaculture Drylands Institute (PDI). PDI is currently undergoing reorganization under the auspices of the Permaculture Institute. Permaculture Institute, USA, Casa Las Barrancas Farm, PO Box 3702, Pojoaque, NM 8750,USA, Email: pci@permaculture-inst.org

Meeting the water farmer

While traveling through Southern Africa in the summer of 1995, I heard of a man who was farming water. I set out to find him without much of an idea of where I was going. Soon I was packed in a colorful old bus roaring through the southern countryside of Zimbabwe at about 30 miles per hour. The scenery was beautiful with rolling hills of yellow grass upon red earth and small thickets of twisting, sometimes umbrella-like trees. I faded in and out of sleep until nine hours later when we were in Zimbabwe's driest region. We crested a pass of low lying semidesert vegetation to see below us a vast high veldt prairie of undulating hills covered with dry grass and often capped with barren outcroppings of granite. Trees were sparse. I was reminded of the open grasslands of southeastern Arizona. In fact, all was covered by a wonderful expanse of

clear blue sky, as one would see in the arid southwestern United States. The bus crept down into the dry grassland and stopped in the small rural town of Zvishavane. This was the area where the water farmer lived. As the sun was setting, I walked off to find a spot to lay my sleeping bag and went to sleep.

In the morning, I hitched a ride with the local director of CARE International. She took me to a row of single-story houses. One of these was the simple office of the Zvishavane Water Resources Project. There on the porch, reading the Bible, sat the water farmer.

As my ride came to a stop, he sprung up with a huge smile and warm greetings. Here at last was Mr. Zephania Phiri Maseko. When he learned of how far I had traveled, he burst into a wonderful laugh. He told me that lately visitors from all over the globe seemed to be pouring in almost daily. Nonetheless, each one is an unexpected surprise.

In the landrover bouncing over worn and eroded dirt roads toward his farm, Mr. Phiri was talking, laughing and gesturing-endless streams of poetic analogies and stories. The best story of all was his own.

In 1964, he was fired from his job on the railway for being politically naive against the White Rhodesian government. He was told by the government that he would never work again in any position. Having to support a family of eight, Mr. Phiri turned to

the only two things he had, a three hectare family landholding and the Bible. He didn't use the Bible only for spiritual guidance or inspiration, he also used it as a gardening manual. Reading Genesis, he saw that everything Adam and Eve needed was provided by the Garden of Eden. "So," thought Mr. Phiri, "I must create my own Garden of Eden." Yet he also realized that Adam and Eve had the Tigris and Euphrates rivers in their region, while he didn't have even an ephemeral creek. "So," he thought, "I must also create my own rivers." He has done both.

Thumbnail link to site plan of Mr. Phiri's farm, ~17K

Learning to farm water

His farm is on the slope of a hill facing north-northeast (providing good sun exposure to the site, as it is in the Southern Hemisphere). The top of the hill is a large, exposed granite dome from which storm runoff once freely flowed. The average annual rainfall is 570 mm (just over 22 inches). However, as Mr. Phiri points out, this is an average based on extremes. Many years are drought years when the land is lucky to receive 12 inches of rain.

When he began, it was very difficult to grow crops successfully let alone make a profit, due to the frequent droughts and zero equipment or capital for irrigation from groundwater. He spent time observing what would happen when it did rain. In small depressions and upslope of rocks and plants, the soil moisture would linger longer than in areas where sheet flow went unchecked. Thus began his self education in rainwater harvesting-and his work. Over a period of 30 years, he has created a

sustainable system that provides all his water needs from rainfall alone.

Thumbnail link to image of unmortared stone walls on Phiri farm, ~18K

"You start catchment upstream and heal the young before the old/deep gullies downstream," says Mr. Phiri. Beginning at the top of the watershed, he built unmortared stone walls at random intervals on contour (that is, along lines of equal elevation). These walls slow the flow of storm runoff as the water moves through the spaces between the stones. This makes the water running off the granite dome more manageable as it is directed to unlined reservoirs, which like everything else, were built with nothing more than hand tools and the sweat of Mr. Phiri and his two wives. The larger of the two reservoirs Mr. Phiri calls his immigration center. "It is here that I welcome the water to my farm and then direct it to where it will live in the soil," he laughs.

"The soil," he explains, "is like a tin. The tin should hold all water. Gullies and erosion are like holes in the tin that allow water and organic matter to escape. These must be plugged."

Mr. Phiri's "immigration center" is also a water gauge, for he knows that if it fills three times in a season, enough rain will have infiltrated into the groundwater to last for two years.

The smaller reservoir directs water via a culvert to an above-ground ferro-cement cistern that feeds his courtyard in dry spells. He has another cistern, shaded by a lush

granadilla creeper, collecting water from his roof. Aside from these two cisterns, all water harvesting structures on the farm aim to infiltrate the water into the soil as soon as possible. Near the home is an outdoor wash basin from which all greywater is drained to a covered, unmortared, stone-lined, underground cistern where the water quickly infiltrates.

Water harvesting structures

From the top of the watershed to the bottom, there are numerous water-harvesting structures such as check dam walls, gabions, terraces, swales and fruition pits.

The government had put in large swales many years ago throughout the region, but they had put them just off contour so that they'd stop sheet flow erosion and carry the storm runoff to a central drainage. The erosion problem was solved, but all the lands were being robbed of their water. So Mr. Phiri dug large "fruition pits" about 10' x 6' x 4' in the basins of all his swales. When it rains, the pits fill with water and the overflow runs into the next pit, and so on up to his property line. Long after the rain, water remains in the fruition pits percolating into the soil. Around the pits, thatch grasses are grown for erosion control, building and sale.

Mr. Phiri has also planted many thriving fruit trees along the swales to provide food, shade and windbreaks. They're watered strictly by rain and the rising groundwater in the soil. As Mr. Phiri explains, "I am digging fruition pits and swales to plant the water

so that it can germinate elsewhere."

"I have then taught the trees my system," continues Mr. Phiri. "They understand it and my language. I put them here and tell them, 'Look, the water is there. Now, go and get it.'" Neither basin nor berm for holding water is put around them; rather, roots are encouraged to stretch out and find water.

A diverse mix of open-pollinated crops such as squash, corn, peppers, eggplant, reeds for baskets, tomatoes, lettuce, spinach, peas, garlic, onion, beans, granadilla, mango, guava and paw paws, along with such indigenous crops and trees as matobve, muchakata, munyii and mutamba are planted between the swales. This diversity gives him food security, for if some crops fail due to drought, disease or pests, others will survive. The use of open pollinated varieties enables Mr. Phiri to collect, select and use his own seed from one year to the next.

Nitrogen-fixing plants abound. The pigeon pea is one example, and is also used for fodder and mulch. Mr. Phiri has found that fertilized soils don't take and/or hold water well. As he says, "You apply fertilizer one year, but not the next and the plants die. Apply manure and nitrogen-fixing plants once, and the plants continue to do well year after year. Fertilized soil is bitter."

The food and fruit Mr. Phiri produces is anything but bitter. He's been generous in his abundance, giving away trees to anyone who wants them. Unfortunately, as Mr. Phiri

points out, the majority of the trees he gives away die when people do not implement rainwater-harvesting techniques before planting. He propagates his trees in old rice and grain bags near one of three open wells near the bottom of his property. Mr. Phiri describes the open wells with another analogy. "Water is like blood-it is always attracted to the wound. Gullies are wounds. Blood goes to the wound to coagulate and heal it. It does this with gabions and swales where the gully is filled with fertile soil." With this knowledge, Mr. Phiri anticipated that the water harvested throughout his land would seep into the soil and make its way to the wounds below; he dug his three wells at the bottom of his land.

Wells of abundance

The soil is his catchment tank. In times of drought, his neighbors' wells go dry (even those that are deeper than Mr. Phiri's), yet Mr. Phiri's wells always have water "into which I can dip my fingers," for he is putting far more water into the soil than he takes out.

Except for one well, which is lined with a hand pump for household water use, all are open and lined with unmortared stone. "These wells," explains Phiri, "are those of an unselfish man. The water comes and goes as it pleases, for you see, in my land it is everywhere."

Thumbnail link to image of Mr. Phiri and his banana plants, ~26K

In times of severe drought, Mr. Phiri will draw from these wells to water annuals in nearby fields. He uses a donkey pump, also known as an Egyptian Shaduf, which is simply a hand pump that uses an old tractor tire to pump the water. A crank opens and closes a bladder (the tire) like an accordion, creating the needed suction. A lush, natural wetland lies below the wells at the lowest point of Mr. Phiri's property. Here, Mr. Phiri practices aquaculture in a series of three reservoirs. As the smaller two dry up, the fish are harvested or relocated to the largest. It is also here that Mr. Phiri densely grows bananas! Dry lands all around him, yet here on Mr. Phiri's farm is a thick forest of bananas! Sugarcane, reeds, and grasses such as elephant grass are also grown on and leading up to the banks to hold the soil. His livestock benefits from the dense grasses, grown to sift the water as it enters the reservoirs. This prime fodder is reserved for his cows when in calf.

When Mr. Phiri began, he was forced to appear in court three times for violating laws that prohibited cultivation in wetlands. These were laws that had been around since colonial times. Finally, on his third court appearance he was able to convince the magistrate to come see his farm. Upon seeing Mr. Phiri's work, the magistrate dropped all charges on the spot.

Within the soil of the farm lie the Tigris and Euphrates rivers; the reservoirs are where they surface. The cycle of Mr. Phiri's Garden of Eden, starting to be noticed after 30 years of obscurity and sometimes scorn, continues to grow. Of the last three decades Mr. Phiri says, "Sure, it's a slow process, but that's life. Slowly implement these

projects, and as you begin to rhyme with nature, soon other lives will start to rhyme with yours." He and the non-governmental organization he created, the Zvishavane Water Resources Project, are spreading his techniques. He has influenced CARE International in his region to the point that, rather than giving away food, they now implement Mr. Phiri's methods so that people can grow their own food.

He has also gone to schools where the teachers were striking due to lack of water and the harsh conditions in dusty, windscraped classrooms. He taught the teachers and students how to harvest the rainfall, and together they've turned the schools into lush gardens and now have no reason to strike. "Remember, children are our flowers," says Mr. Phiri, "give them water and they will grow and bloom."

Mr. Phiri's project is very much at the grassroots level (a big reason why it works). Mr. Zephania Phiri Maseko, ZWRP, P.O. Box 118, Zvishavane, Zimbabwe.

Author information

Brad Lancaster is a permaculture teacher and designer in Tucson, Arizona. You can reach him for comment by email at bradlank@aol.com. This article will be incorporated into an upcoming book that Mr. Lancaster is writing about water harvesting techniques.

Additional web resources

Rainwater Harvesting Campaign, Center for Science and Environment
http://www.oneworld.org/cse/html/cmp/cmp43.htm
The CSE is one of India's leading environmental NGO's. One of its focuses is on promotion of rainwater harvesting. Although its primary focus is on India, this web site offers much information that is pertinent to rainwater harvesting around the globe.

Harvest Rainwater Guidelines
http://www.greenbuilder.com/sourcebook/RainwaterGuide1.html
This document comprises one section of the online Sustainable Building Sourcebook, part of the Green Building Program of the city of Austin, Texas, USA. It provides guidelines for sizing rainwater harvesting systems for urban dwellings. The site will be most useful to residents of the USA as the numbers given are not in metric units; however, the general guidelines and principles outlined may be useful to those in other geographic regions as well.

Bountiful Harvest
http://weeklywire.com/ww/08-24-98/tw_feat.html
As this online document demonstrates, the author of this article knows quite a bit about rainwater harvesting himself. "Bountiful Harvest" is an article from the Tucson Weekly that chronicles the activities of Mr. Lancaster and others in harvesting rainwater from their homes in and around Tucson, Arizona, USA.

About the Arid Lands Newslette r http://www.arid.arizona.edu/

Survival skills for Kenyan schools

In 2005-6, up to one in ten Kenyans faced starvation, as drought swept across East Africa. Yet while some schools closed due to food shortages, the Father Makewa High School in Machakos district has a different story. Located in Katangi division, some 200 kilometres from the nearest town, the school is surrounded by baked and dusty earth. Yet despite four years of drought, the school Principal is keeping his 290 students off food aid.

Beating drought

Principal Joseph Mbindyo demonstrating one of the irrigation water pans. credit: Ebby Nanzala

When Principal Joseph Mbindyo took over the school in 2004, he liaised with the parents of children attending the school to introduce the uncomplicated yet innovative technique of water-harvesting. Four long trenches stretching through 26 acres of waste land around the school were dug out. Lined with

plastic sheeting, water pans were formed to hold runoff water to use for irrigation during dry spells. The school has also integrated local sesbania trees for nitrogen fixation in the soil, and organic manure is used on the entire farm. As a result, Mbindyo's harvest can survive four extra months of the growing season each year, and yields have been doubled, despite the presence of drought.

"We had to struggle before the crops started showing signs of stability," says Mbindyo. "But with our work and God's grace, we have not asked outside people for food aid." However, having failed with staple foods like maize and beans, Mbindyo is careful about what he grows. Now, he avoids these low value crops which need a lot of land and require more time to mature. Instead, watermelons, tomatoes, onions, cabbages, pawpaw, kales, capsicums and French beans sprout thickly, as though growing in a region of adequate rainfall. Some of the harvest is sold later to buy the staple foods for his students' three meals per day. Where maize sells for 28 Kenyan shillings (US$ 0.40) per kilogramme, watermelons can fetch 10 times that in the local markets; the same applies to cabbages, capsicums and French beans.

Take-home messages

Mbindyo originally learned his agricultural techniques from his farmer parents, before completing a postgraduate degree in agriculture at the University of Nairobi. He insists that Africa's perennial reliance on outside help could be reduced if people looked for home grown solutions. The school wastes no water - even water used in the kitchen is collected, purified with ash and re-used for irrigation. Students willingly take on tasks like mulching the farm. Most of the workers in school are parents who work on the farm to subsidise school fees, and many of them are adopting the techniques to their homes. According to Mbindyo, the impact of the school's success is also being seen more widely: "People in

Katangi division are adopting this system of farming, contributing to food security in the semi-arid region of Kenya," he says. Further recognition came during this year's World Environmental Day, when the school scooped the top award for environmental conservation in Machakos District.

Principal Joseph Mbindyo and some of the students tend to the cabbages on the farm. credit: Ebby Nanzala

Further plans for the school are in the pipeline. The Area Member of Parliament, Charles Kilonzo, has used the Constituency Development Fund (CDF), to construct a road leading to the school, which was previously inaccessible by vehicle. A groundwater bore-hole is in its final stages, but the school is still short of the Ksh 108,500 (US$1,500) needed for a pump. Daniel Kivindyo, area education officer at Katangi Division, says the school has demonstrated that if a community has a vision, hunger can be eliminated. "Anyone who understands the climatic condition of the Katangi region and the plight that students face, would definitely agree that the project is one which could reduce hunger." But Kivindyo notes that although the school is showcasing excellent farming techniques and food generation, it still

has a deficit of over Ksh 1 million (US$14,000) and it will require outside assistance from the government and other donors to be entirely self-sufficient.

Meanwhile, Principal Mbindyo believes that the school will earn over Ksh 1.1 million (US$15,000) in revenue by next year. The school's goat keeping project has also picked up. Students have goat meat on their menu, which, he believes, is a 'noble' achievement. "I never experienced how good it feels having three meals per day - especially meat during the drought season," says Mary Nyile, a form four student at the school. "My parents have adopted the innovative techniques and we never go hungry."

Article written by Ebby Nanzala

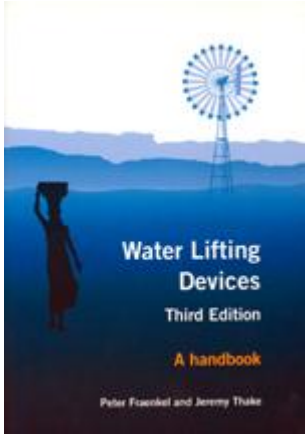
Water Lifting Devices. A handbook for users and choosers
Bourton on Dunsmore, U.K., 2006, 350 pp.
ISBN 978-92-5-105430-7
$40.00

More than one billion people still do not have access to safe drinking water, and almost two billion people suffer from diseases arising from contaminated water due to poor sanitation. Irrigation is essential for the basic food requirements of billions of people. The growing world population and global climate change make the challenges of providing adequate clean water, sanitation, and food ever more pressing.

At the heart of effective irrigation lies the problem of lifting or pumping water. This handbook provides a detailed review of the water-lifting technologies available for irrigation, along with new information covering the provision of drinking water for humans and livestock. The book provides an overview of the entire spectrum of pumps and water lifting devices for small-scale applications and a basis for comparing and choosing between them. The main purpose is to provide a comprehensive single source of practical information for decision-makers concerned with the selection, sizing and procurement of water lifting systems and their power sources for both the supply of drinking water and for small-scale irrigation.

Water Lifting Devices **has long been the authority on the subject and this new third edition provides**

updated essential practical information for farmers, development workers, and all who need to make informed choices about water lifting technologies. (Co-published with Practical Action Publishing, UK)



02/21/2008

Eco Plots for Small Farms Serving Cities

Writer: Kurt Knebusch, knebusch.1@osu.edu, 330-263-3776

WOOSTER, Ohio — Joe Kovach set out to gross $10 per row foot, equal to a robust $90,000 per acre, in his innovative farm plots of mixed fruits and vegetables.

So far, based on the crops that he has in production, the Ohio State University scientist has achieved exactly that. The two final crops in the lineup, apples and peaches, are set to start producing this summer.

An ecological pest management expert, Kovach is midway through a six-year study of four different types of polyculture modules — plots with a mix of such high-value crops as snap peas, green beans, blueberries, raspberries, strawberries, tomatoes and edamame, or edible soybeans.

He aims to determine the best-working layout — best in terms of economics, efficiency and pest density — for intensive mixed plantings by small farmers. He calls it "modular ecological design." The goal is food for urban consumers that needs precious little oil to reach them.

“The whole concept of urban agriculture is to grow the food close to where the people are,” said Kovach, who holds joint appointments with the Ohio Agricultural Research and Development Center (OARDC) and with Ohio State University Extension.

Urban agriculture cuts shipping and fuel use; Ohio’s rural/urban Medina County, for example, is closer to Cleveland than California is.

“My view,” Kovach said, “has always been that eventually we’re going to run out of oil.”

Good for Small Farms, Big Yards

The researcher, who heads Ohio State’s Integrated Pest Management (IPM) Program, designed, established and continues to study a total of 16 polyculture plots: four treatments replicated four times each. Each plot measures about 44 by 60 feet, good for small farms or even big yards.

The study began in 2005.

“My goal at the start was to get $10 per foot of row,” Kovach said. “Of the six crops we had producing last summer, on average, we got $10 per foot of row. We lost on things like edamame soybeans, but we made it up on other crops.

“Right now, we’re still not in full production,” he said. “We don’t have any peaches or apples yet. So we haven’t technically hit our goal. But I’m hopeful with everything producing we will. I don’t think we’ll have any problem reaching it.”

The peach trees were planted in 2005. But spring frost killed their flowers in both 2006 and 2007.

The apple trees, planted in 2006, will start to bear fruit this summer.

“Then we’ll really get an idea of how productive we can be,” Kovach said. “The system’s starting to balance out now. It takes a while. But I think we’re reaching some stability.”

Among the past three years’ returns, all based on prices received through a local farmers’ market: $1.99 per row foot for green beans in 2005; $3.65 per row foot for edamame last year; $5.67 for blueberries last year, the first fruiting year; $11.83 for tomatoes in 2005, $26.67 in 2006 and $25.52 last year; $9.21 and $12.65 for strawberries in 2006 and last year, respectively; and last year $13.27 for summer raspberries and $15.36 for fall raspberries.

Layouts Hinder Pest Spread

The four test treatments — solid row, mixed row, mixed row on raised beds and “checkerboard” — represent four different ways to arrange the crops.

The aim of each treatment is to earn a living — for a farmer or gardener to do it, that is — while keeping pests from doing the same.

The layouts are meant to stop or slow the spread of pests from plant to plant — previous studies having shown that alternating crops and heights can do that. Kovach wants to verify it and to see which arrangement does it best.

Each “solid row” grows a single crop, with crop height switching from row to row: a row of tall apples, a row of short strawberries.

The “mixed row” treatment has multiple crops in a single row but keeps tall types and short types together in their own rows: a row of tall apples, peaches and raspberries; a row of short tomatoes and strawberries. The same layout then is used in raised beds to make up treatment #3.

The “checkerboard” treatment has varying types of crops within a row and also alternates heights in the row. The same row down the line may have low tomatoes, high apples, low strawberries and tall peaches.

New High Tunnels a Boon

Changes made last year included laying weed-stopping landscape fabric in all 16 of the plots. And high tunnels were set up over four of the plots — one plot representing each treatment.

The landscape fabric eliminated the need to weed or mulch the plots. “Basically, weeds are a non-issue now,” Kovach said. Weeding costs, thanks to the fabric, fell from $1.35 per foot to less than 10 cents per foot.

And the high tunnels — unheated structures covered by clear plastic designed to lengthen the growing season — boosted average growth inside by 14 percent when compared to the same crops grown outside.

Tunnel-grown raspberries especially saw big gains: the yield of summer raspberries inside went up by 96 percent, of fall raspberries, by 79 percent.

The tunnels added $9.50 per foot to the $3.20-per-foot establishment cost of the basic, non-tunneled, plant-in-the-ground plots.

The raised beds added $1.20 per foot to the basic establishment cost.

All together, the establishment cost for the raised-bed plots totaled $4.40 per row foot, for the high-tunnel plots $12.70, and for the raised-beds-in-high-tunnel plots $13.90.

Are raised beds, high tunnels or both in fact worth it? The results so far suggest that they are. Kovach said the yield jump seen in the raised beds — 20 percent to 125 percent more than the on-the-ground plots, depending on the crop and probably due to better drainage and fewer pests — paid for their extra cost the first year. After that, the yield jump is "pure profit," he said.

The high tunnels, meanwhile, will take another year or two to pay off their establishment cost. Then their higher yields should start to show up, too, as profit.

Overall, the crops in the tunnels saw different but generally fewer pest problems. For example, last summer, while Japanese beetles plagued outside crops, few of the pests ended up getting inside. Instead, the tunnel crops saw aphids and mites and also more powdery mildew, a disease.

The tunnel's benefits, including greater growth, higher-quality fruit, and earlier- and later-in-the-season yields, should more than offset such drawbacks, Kovach said.

The Japanese beetle indeed created tremendous problems last summer, Kovach noted, especially on raspberries and edamame. Populations of the ravenous pest were 15 to 20 times higher than they had been the past two years.

"We kind of expected that to happen," Kovach said, since the beetle is a generalist and the plots serve a wide-ranging, general menu. Certain varieties of certain crops saw little if any damage, however — a possible clue to controlling the pest.

"If it wasn't for the Japanese beetle," Kovach said, "it would have been paradise out there."

Also invading Eden last year: deer, which jumped the electrified woodchuck-height fencing and caused modest but unwanted crop damage. Tall, plastic deer fencing went up.

The plots stand ready for 2008.

'I'm Pretty Optimistic'

"Right now I'm pretty optimistic," Kovach said. "We've accomplished our goal of increasing biodiversity out there. We have spatial diversity — we have different heights of plants — and we have temporal diversity through different planting times and different varieties and when they mature.

“I think we can produce a lot of food,” he said. “But success all depends on your market. The more you can get, the better off you are; it’s a lot easier to earn $10 per foot of row if you get $6 a pound for a crop versus $2. You really need to make sure that your market is available. I think that it is.

“All indications are that we’re moving in a direction where this will work.”

Links: Ohio State modular ecological design research, http://ipm.osu.edu/pageview.asp?id=16. Ohio State high-tunnel research, http://www.ag.ohio-state.edu/~news/story.php?id=3392, http://www.ag.ohio-state.edu/~ news/story.php?id=3944.

http://www.ipm.osu.edu/files/SW%20Ohio.pdf

Dear Reader,

I wish that he were organic, no-till. I believe that his goal should be highest profit per acre rather than highest gross per acre.

See the Joe Kovach Farm folder above. PDF file of photos and information.

Ken Hargesheimer

A tale of two local food projects:
Communities as well as producers see benefits

By Laura Miller
Newsletter editor

Two local food projects have made a difference in their communities. Competitive grants from the Leopold Center have jump-started local food projects in Black Hawk and Johnson counties. The result has been more interest in "buying local" and additional opportunities for area business owners as well as farmers.

For the Local Food Project at the University of Northern Iowa, the opportunity has added up to money that has stayed in the Waterloo-Cedar Falls area.

Growing more than food

During the past five years, eight institutions participating in the UNI project (including nursing homes, hospitals, schools and two restaurants) have purchased a reported $783,000 of meat, fruits and vegetables from farmers in Black Hawk and neighboring counties. Some growers estimate that institutional sales represent 15 percent of their total sales. Two businesses now buy all of their beef and pork from local locker plants.

"This is just the tip of the iceberg for the potential of capturing food dollars locally," said Kamyar Enshayan, who heads the Local Food Project operated at UNI's Center for Energy and Environmental Education.

He estimates the 49,900 Black Hawk County households spend about $300 million each year on groceries and eating out. "Retaining as much of the food dollars locally as possible is good community economic development," he said. "It builds on our most precious assets: our people and our land."

Enshayan has found that every dollar invested in the UNI Local Food Project funneled $6.50 into the regional economy

In 1998, Enshayan received a $17,000 annual grant for three years to set up the Local Food Project, which has since been renewed for an additional three years. Funds support educational activities as well as salaries for summer student interns. They make weekly calls to 10 to 15 farmers who are part of the growers network to determine the type and quantities of produce available. The information is faxed to 10 food buyers, who work directly with farmers for delivery. At the peak of the growing season, the weekly selections may include 40 to 50 fruits and vegetables.

Growing restaurant support

Barry Eastman, who owns and operates Rudy's Tacos, said the UNI project helped link him with 10 or 12 farmers and a local locker plant that supply 100 percent of the beef, pork, chicken, cheese, tomatoes and black beans served in his Waterloo restaurant. Locally raised meat and produce make up 65 percent of his annual food purchases, or about $120,500. He features the farmers on table tents in the restaurant.

Six years ago, Eastman said the UNI project helped him find a local source for free-range

chickens, which he had read about in trade publications.

"I'm always looking for better ingredients – that's part of my job," he said. "But when I cooked this chicken, the difference in taste just blew me away. From then on I have tried to get everything locally that I could. I also want to support our local family farms."

"The response from my customers has been great," he added. "Almost on a daily basis I hear from people who really like the local foods."

Robin Gaines, director of nutrition services at Bartels Lutheran Retirement Community in Waverly, has seen similar enthusiasm from many of the 200 residents. In 2002, the dining service purchased all of its beef and pork, about $40,000, from a local locker plant. The dining services also uses as much seasonal produce as possible from local farmers.

"Our residents wanted fresh tomatoes and we had trouble finding enough at the farmers market," Gaines said. "A local hospital put us in touch with the UNI project and we've been buying locally since." Residents also enjoy helping the dining staff husk sweet corn delivered fresh from the field.
"We are in a farming community," she added, "and many of our residents were farmers or have some connection with farming. This is our way of giving something back to the community."

Growing community interest
In the Iowa City-Coralville area, the Johnson County Soil and Water Conservation District's local

food project grew so quickly that total sales could not be tracked for the entire three-year grant. The commerce that was tracked, however, nearly tripled, with most white-tablecloth restaurants now offering some kind of locally grown food on the menu.

Carol Hunt, who manages the Johnson County local food project, also has seen tremendous support for local foods. As part of the Leopold Center grant that ended June 2002, Hunt compiled a directory of producers in a nine-county area. The directory lists 125 farmers, and the list has nearly doubled in three years. Many of those producers support five area farmers markets, including one new venue.

Hunt also helped develop initial relationships between farmers, chefs and area food service personnel. She worked with community groups to explain the benefits of buying locally grown products. More than 20 all-Iowa banquets for 1,500 people resulted in at least $10,000 in additional sales for local farmers.
Hunt estimates that if each of the 44,000 households in Johnson County spent just $10 a week on local foods, an estimated $23 million would stay in the local economy

Iowa City chef Kurt Friese relies on 20 to 30 sources for locally grown products to supply his two Iowa City restaurants. Although buying local is a simple concept, he said that someone needed to do the preliminary work.

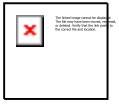
"When I came to Iowa City 11 years ago, I was almost the only person interested in buying local," he said. "Interest has grown by leaps and bounds but this doesn't happen by itself

because it's too easy to buy frozen French fries off the back of a truck. There is a local food system here because of Carol and the Leopold Center project."

Enshayan said that neither producers nor food buyers have the time to develop the network needed to make a local food system work. And he said the process does not happen overnight.

"The real work of the Leopold Center is not just as a source of grants, but in bringing people together," he said. "That's where new ideas are discussed and projects are built."

- **More about the UNI Local Food Project**
- **Get a copy of the Johnson County final report summary [PDF only; see pages 1-4]**



Project Goal:

Working with institutional food buyers (hospitals, nursing homes, colleges, restaurants, and groceries) to explore ways they could purchase a greater portion of their food from local/regional farmers and food processors in Northeast Iowa.

Rationale:

Iowa spent over $8 billion on food in 2000. Residents of Waterloo/Cedar Falls metro area alone spend nearly $300 million on food groceries and eating out every year (Table 1). Most of these food dollars leave our county and the state. It is possible to significantly reduce this leak of financial capital. There are many ways of investing our food dollars locally and institutional food buyers can leverage their buying power to support fresh, locally raised products in season and encourage the development of a more diverse agriculture around. We are working to strengthen the local food economy of our region.

Table 1: Dollars Spent on Food and Eating Out (2001)

Location	Households (000's)	Food & Bev. Stores	Food Service & Drinking Establish.

	49.9	$244,205,000	$143,877,000
Black Hawk County		$335,481,000	$242,580,000
Cedar Rapids	76.7	$825,786,000	$554,572,000
Des Moines	182.4	$4,839,750,000	$2,769,691,000
State of Iowa	1,115.40		

Source: *Sales and Marketing Management*, 2001 Survey of Buying Power
Compiled by Kamyar Enshayan

Background:
In 1997 the UNI Local Food Project, with a grant from Leopold Center for Sustainable Agriculture, began working with three institutional Food Buyers: Allen Memorial Hospital and Rudy's Tacos in Waterloo, and the University of Northern Iowa in Cedar Falls. We worked one-on-one with food service managers of each institution and assisted in linking them to farmers and processors. The list of institutions we are working with is expanding every year. As a result of our project, significant amount of food dollars were invested in the local economy (see Table 2). Table 3 shows detailed food budget for one small restaurant in Waterloo, Iowa. As you can see the local food expenditures can be significant. To see the chart of seasonal availability of food in Iowa click here.
Table 2: Local Food Purchases by participating institutions

	Year	Meat	Fruit & Vegetables	Other
Allen Hospital	**2002**	**$0**	**$2,174**	**$0**
(Waterloo, IA)	**2001**	**ND**	**$3,000**	**ND**
	2000	**$37,853**	**$6,429**	**ND**
	1999	**$0**	**$7,874**	**ND**
	1998	**$0**	**$4,845**	**ND**
Rudy's Tacos	**2002**	**$68,830**	**$15,153**	**$36,551**
(Waterloo, IA)	**2001**	**$63,469**	**$15,447**	**$64,024**
	2000	**$62,803**	**$10,552**	**$49,753**
	1999	**$63,672**	**$4,090**	**$58,937**
	1998	**$19,794**	**$2,200**	**$75,733**
University of Northern Iowa	**2002**	**$1,957**	**$6,326**	**$617**
(Cedar Falls, IA)	**2001**	**$0**	**$6,165**	**ND**
	1998	**ND**	**$8,201**	**ND**
Bartels Lutheran Home	**2002**	**$34,223**	**$2,583**	**$3,239**
(Waverly, IA)	**2001**	**$6,882**	**$2,023**	**$408**
	2000	**$0**	**$2,501**	**ND**
	1999	**$0**	**$0**	**ND**

Western Home (Cedar Falls , IA)	**2002**	**$0**	**$1,692**	**$5,064**
Roots Market (Cedar Falls , IA)	**2002**	**$7,656**	**$3,049**	**$10,501**
Garfield's Cafe (Waterloo, IA)	**2002**	**$0**	**$1,115**	**$0**
Waverly Municipal Hospital (Waverly, IA)	**2001**	**$0.00**	**$264**	**ND**
Wartburg College (Waverly, IA)	**2001**	**$0.00**	**$1,383**	**ND**
Covenant Health Systems (Waterloo, IA)	**2001**	**$348**	**$2,000**	**ND**
Mercy Health Systems (Mason City, IA)	**2001**	**$0**	**$175**	**ND**
	2000	**$0**	**$3,515**	**ND**
	1999	**$0**	**$0**	**ND**

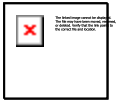
TOTAL LOCAL FOOD PURCHASES	**$367,487**	**$107,947**	**$304,827**

GRAND TOTAL (1998 - 2002) $783,951
ND = These numbers were not documented

Table 3: Rudy's Tacos 2002 Local Food Expenditures

	Local $	Total $	% Local Purchases
Beef	**$48,640**	**$48,640**	**100%**
Pork	**$ 900**	**$ 900**	**100%**
Chicken	**$19,290**	**$19,290**	**100%**
Cheese	**$33,499**	**$33,499**	**100%**
Tomatoes	**$14,718**	**$14,718**	**100%**
Black beans	**$ 355**	**$ 355**	**100%**
Garlic	**$ 80**	**$ 160**	**50%**
Ice cream	**$ 955**	**$ 1,599**	**60%**
Sour cream	**$ 2,098**	**$ 3,431**	**61%**
Misc	**$ 0**	**$62,985**	
Total	**$120,535**	**$185,579**	

65%



Accomplishments of the Project

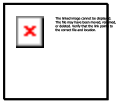
upup

- **The ten institutions we have worked with so far have spent nearly $600,000 of their food purchases locally. These are the dollars that would otherwise leave our state and even the country. We figured for every dollar invested in this project, we have helped $6.5 stay in our community and region. That's *real* community economic development; beats casinos!**
- **At Rudy's Tacos, one of our collaborators, 71% of the restaurant's food budge is spent on fresh, locally-grown ingredients. That amounted to $143,000 for 2001. If half of Iowa's restaurants did what Rudy's is doing, we could see a revitalization of Iowa's farms and small towns. There is great potential in eating locally, and we are working on it.**
- **Many UNI students have worked on this project and have gained insights about possibilities for food and agriculture in Iowa and the Midwest. Our work is inspiring others locally and nationally. USDA has chosen our project as one of a dozen successful projects nationally.**
- **The farmers who participated in this project benefited:**

	Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5	Farmer 6	Farmer 7	Farmer 8	Farmer 9	Farmer 10
Approximately how much of your gross	<5%	<5%	<5%	5-10%	<5%	~15%	~15%	-	10%	-

income increased as a result of this Project										
On a scale of 1 to 5 (1 least satisfied 5 most satisfied) how would you rate your satisfaction with the project?	**3**	**4.5**	**5**	**5**	**4**	**5**	**4.5**	**5**	**5+**	**5**

- **We have begun an Internship Program to assist food buyers while creating educational experience for students interested in food, community, and agriculture.**



Lessons Learned **upup**

1. Each institution is different. Farmers and local food organizers should consider the following aspects when approaching a food buyer.

Who is running the food service? Institutions who run their own food services have more control over decisions compared to those who out-source the entire food service.

Are they buying from multiple vendors or a prime vendor? Institutions who buy from vendors have more flexibility. Institutions who have to buy a certain percentage of their food from specific vendors can still buy certain things local.
When do they need what kinds of products? Schools for example are not in session in the summer months, but restaurants have year-round demand.
Who are the people who eat there? Winter squash might not go very well with college students, but the elderly at a nursing home might love them.
How committed and flexible are they? That can vary greatly from place to place and in time.
How will they benefit from local buying? Some institutions such as restaurants may see immediate pay off from buying locally, while other institutions (i.e. public schools) may not be able to get any marketing or public relation value from serving locally-grown food.
2. A positive working relationship with the food buyer/staff is critical. Most of the buyers we have worked with were not necessarily all that committed at the beginning. In time, as we all took little steps that worked, commitment and trust grew.
3. Food service managers are extremely busy. They are unlikely to take on initiatives that will require more work. In our experience, our success was based on providing assistance to the dining managers to make the process of local food buying smooth and practical. Once the benefits are experienced, the routines will develop to more local buying.
4. It can be done. Our results show that institutional markets are significant and can be expanded.
5. It takes time. Strengthening the local food economy involves a new set of relationships, new marketing pathways and, in a way, a new infrastructure. That will take time and continued efforts for a decade or

two.

6. Much more can be done to expand institutional markets. This project involved only three institutional buyers (originally) whose impacts were significant for the farms around them. There are many more institutions that could do the same and more.

7. We need public policies at the state level that provide incentives for institutional buyers to buy locally. The State of Iowa could develop a policy whereby state-funded institutions would develop plans to significantly increase their purchases Iowa grown food. As part of such policy, state would provide assistance to these institutions to identify local sources and implement increased local purchasing and document the process.

8. Need to document the economic and societal benefits of local food buying more thoroughly. We need to document, for example, how exactly a specific local food purchase has had specific economic and social benefit. 9. *Locally grown food can be price competitive.* From our own experience with institutions, local food purchases did not result in significant increase in the food budget, though we did not keep detailed records. To see the chart click here.

Challenges & Opportunities:

One objective of this project was to identify barriers and opportunities for institutions to buy food from nearby farms and processors. The following is a description such opportunities and challenges.

Distribution Contracts. Many institutions have contracts with one or more distributors. Often they are required to buy 80% of their food from one contractor. At Allen Memorial Hospital that was the case. Unless flexibility is built into these contracts, the local buying potential is limited. Rudy's Tacos purchases food from many distributors with no particular contract. Some institutions out-source their entire dining services to a company to run. In those cases, depending how the contract is written, the local buying potential can become limited.

Insurance. Based on our experience, in several situations, institutions have told local farmers that a minimum of $1 million insurance is necessary to become a vendor for that institution. That usually has been the case when the institution has out-sourced their dining services to a company that requires such insurance. Mr. Jacobsen of Allen Memorial Hospital believes such insurance is not necessary. First, the institution usually carries its own insurance in the case of a proven food-related illness. Secondly, he believes it is the food buyers job to make sure what comes in is OK; and through experience he has seen high quality produce and meat from local sources and often the opposite from unknown non-local sources. Thirdly, insurance will not resolve anything, he says. None of the institutions that our project worked with require such insurance from nearby farmers.

Lack of Supply. There is a lack of fruit and vegetable production in our region. At the present time, ten or so farmers that we have relied on are basically it for supplying institutional market. And many of them at the present time could not supply the present demand, should the cooperating institutions order more.

Lack of processing infrastructure. Most of what is served in many institutions are pre-processed – canned, frozen, precooked, precut, or processed in some fashion. The basic facilities such as canneries, creameries, and mills, once very common in Iowa are very rare now. These were places that provided processing capacity for local products. One of the few processing places still in use, and accessible to local farmers and buyers, are the meat lockers. To what extent they can supply a higher volume to institutional buyers

needs to be studied.

Culture of pre-processed food. Institutional kitchens have become accustomed to pre-processed food, and to food items that have long shelf life. Short supply of labor, and centralization (meals all prepared in one kitchen and served at satellite locations) often drives many kitchens to order pre-made food items. Purchasing more local food means you need to cook with them from scratch, with more planning and flexibility to accommodate local products in season. For many items substituting an item for the local one makes no difference. A locally grown apple will not require any more processing or labor than a distant apple. Depending on the item more planning may be necessary, but from our experience with cooperative institutions, there is some initial getting used to required. Some local produce are much more perishable than traditional produce, mostly because local varieties were bred for taste not a week-long truck ride, and lack of treatment with waxes and post harvest pesticides, a necessity for shipped produce.

Commitment of the kitchen staff. This is crucial for the sustainability of the relationship. Enthusiasm and interest of the food buyer and other kitchen staff is a must. It often takes time for enthusiasm and commitment to develop. Farm tours, seasonal charts for product availability, and workshops with experienced chefs are among initiatives that will help develop ownership and commitment to local food sources.

Opportunities for farmer cooperatives. In a state like Iowa when there are so few vegetable farms, it helps if several farmers pool their products to offer an institutional buyer volume and variety, in addition to one-call ordering system. "GROWN Locally" a farmer cooperative based in Decorah, Iowa has done this successfully.

Subj: Announcing our Oklahoma food order delivery service
Date: 8/15/2003 9:32:08 AM Central Daylight Time
From: rmwj@soonernet.com
To: comfood-l@listproc.tufts.edu

For more information contact Robert Waldrop, 405 613 4688

FROM OUR FAMILY FARMS TO YOUR FAMILY TABLE:
-- Oklahoma Food Order Delivery Service Will Bring the Farmer's Market to the Customer's Front Door

- **Group offers help to Wrangler workers in Seminole to help them start market gardens to create secure, local jobs in rural areas.**

  The Oklahoma Food Cooperative Organizing Committee is happy to announce a new local food order delivery service to bring the freshest local Oklahoma foods direct from farmers to customers.

-

- **Offering the ultimate in convenience for busy people – home delivery each week -- the organization will feature a product line of Oklahoma all natural beef, pork, lamb, eggs, dairy products, peanuts, certified organic vegetables and herbs, processed foods such**

as jellies and jams, condiments like salsa and barbecue sauce, and nonfood items like body care, medicinal, and house cleaning products. "You could make a meal out of what we deal," says Robert Waldrop of Oklahoma City, founder of the group. All products listed with the Oklahoma Food order/delivery servivce are Oklahoma grown or made, and they are offered to customers direct from those producers.

-
- **"Buying food directly from farmers is a way to give your family the freshest and highest quality foods, while at the same time doing good work building a more secure and sustainable future for all Oklahomans," says Waldrop. "The fastest,easiest, and cheapest way to bring economic relief to rural communities is by helping farmers sell products directly to the public. Oklahoma City used to be a center of direct relationships between farmers and customers, and as those relationships have declined, so have our rural communities," he continued. Waldrop says that the secret to cooking great meals like your grandmother produced is to cook from basic foods and use the freshest local ingedients.**
-
- **While most of the people participating are presently in the Oklahoma City, Norman, and Edmond, the group is working to extend its efforts to other areas such as Tulsa, Lawton, Enid, and Muskogee. Oklahoma Food is raising money to establish its service by selling memberships, which cost $50, and will begin its weekly service when it**

reaches 200 members. Tulsa service can begin with 33 members in that area; Enid with 25, and the group can do an OKC-Guthrie-Stillwater route with 25 members.

- **This new cooperative enterprise positions Oklahoma to become a leader in the burgeoning "local food" movement, which has been described as "the next new thing in food". "Cultural Creatives" and "Cultural Conservatives" are both excited about the idea of such easy access to fresh local food, and the group hopes the presence of its service will make Oklahoma communities better places to live, and contributes to the health and happiness of Oklahoma families. The group's goal is to use its order delivery service to "bootstrap" its way into opening retail stores that only sell Oklahoma foods.**
- **The Oklahoma Food Cooperative Organizing Committee has also begun an outreach effort to the Wrangler workers in Seminole who are losing their jobs, encouraging them to begin small market gardens to help them create secure local jobs based on their own initiative and work, and is offering to help them market their produce.**
- **The members of the board of directors are: Kim Barker (Waynoka), Kathy Carter-White (Tahlequah), Jonalu Johnstone (OKC), Walter Kelley (Norman), JoAnn Logan (Edmond), Mark Parman (Webbers Falls), Robert Waldrop (OKC)**

-
- **For more information:**
- **http://www.oklahomafood.org/okfoodservice.htm description of the nuts and bolts of the service**
  http://www.oklahomafood.org/okfbudget.htm budget information
  http://www.oklahomafood.org/gettingstarted.htm philosophy of local food

  National websites regarding local and slow food movements:
  http://www.localharvest.org
  http://www.slowfood.com
  http://www.foodroutes.org

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GARDENS/MINI-FARMS NETWORK

USA: TX, MS, FL, CA, AR, NM, WA; Mexico, Rep. Dominicana, Côté d'Ivoire, Nigeria, Nicaragua, Honduras, Kenya, Malawi, Mozambique, Haiti, England, India, Uzbekistan

minifarms@gmail.com

**Workshops in organic, no-till, permanent-bed gardening, mini-farming, mini-ranching using bucket drip irrigation,
worldwide in English & Español**

Farm Village
An Idea Whose Time Has Come

A large tract of farm land would be acquired near a city or between two nearby cities and on or very near a major highway. Each farm is owned and operated by a family. The business buildings are owned by the Village. The businesses are privately owned. The Village is a cooperative? Corporation?

Off the highway would be a large parking lot. At the back of the parking lot would be: restaurant[s], bakery, farmer's market, craft store, coffee/sandwich shop, etc. These would be the market for production from the farms. The rear of these would open to a large plaza.

**On one side of the plaza would be: bank, barber shop, beauty salon, grocery store,
On one side would be: public or private school or homeschoolers facilities, church building, library,**

On one side would be: village offices, Education Center,

Recreational: horse back riding, farm tours, hay rides, swimming lake, farm petting zoo, RV Park, etc.

Educational Center would offer workshops in organic garden and farming as practiced in the Farm Village as well as its related businesses. I believe that people would come from all over the world.

Divide the land up into farms/ranches: dairy, goat dairy, vegetables, nuts, grapes, fruits, horses, pigs, sheep, meat goats, beef, turkeys, ducks, chickens, hens, orchards, colored cotton, hemp fiber, gourds and other farm craft plants, flowers, fish ponds and anything else that there is a market for and can be grown.

Value-added plants: raw cheese making, raw milk bottling, jelly making, freezing, canning, meat plant and other value-added processing to sell in the stores and serve in the restaurant. Who knows what else?

Farmers would probably live on their farms. There should have homes, apartments, etc for people working in the Village.

Bicycling would be encouraged. Vehicles are restricted to the parking lot and farm roads. Processing plants would be along highway to keep traffic out of The Village.

The grassroots movement in this country to "buy local, buy fresh, buy organic" would support this and I think we would see many of these built across the country. Today, I read a report that Wal-Mart will begin buying locally. Fuel cost is the real reason, I think.

Since my main interest is organic farming, I will only mention: solar electricity, wind power, solar heating, solar water heating, soil-cement bricks. Someone else can direct these.

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Box 1901
Lubbock TX 79408-191

Feel free to email ideas.

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GARDENS/MINI-FARMS NETWORK

USA: TX, MS, FL, CA, AR, NM, WA; Mexico, Rep. Dominicana, Côté d'Ivoire, Nigeria, Nicaragua, Honduras, Kenya, Malawi, Mozambique, Haiti, England, India, Uzbekistan

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**Workshops in organic, no-till, permanent-bed gardening, mini-farming, mini-ranching using bucket drip irrigation,
worldwide in English & Español**

Farmer's Market Store

This is a store marketing food directly from farmers but the farmers do not man the stalls. Farmers like to produce food but many, if not most, do not like to sell.

A store is opened with "stalls" owned and stocked, directly, by individual farmers just like in the farmer's markets but only one farmer is present each day to talk and promote their

food. Farmers rotate one day at a time. They come in and stock their stall daily or every two days or as needed.

Each farmer's food has a SKU. The farm name is over the stall or display. Customers come into the FMS and take a basket or cart and select what they want to buy. They go to the checkout counter and pay. The computer, using the SKU, credits each farmer for the sales. Payment is made to each farmer weekly, biweekly or monthly.

The store has a clerk. The farmers share the cost of operating the FM store: clerk's salary, heating/cooling, utilities, rent, advertising, etc. Several stores could be operated and farmers could market in all of them.

I wish that someone would try this idea some where.

Ken Hargesheimer

Homestead Heritage combines farming, arts and a bit of tourism
Friday, September 26, 2003 By KAREL HOLLOWAY / Special Contributor to The Dallas Morning News

ELM MOTT, Texas – The seasons are changing, and temperatures are dropping. Cedar scents the air and the clop of the horse's feet is slow and even. It's a short hayride to the bluff overlooking the farm fields.

Thick trees mark the line of the Brazos River. It's quiet – no traffic rumbling, no airplanes – just birds catching the breeze to glide along.

Homestead Heritage farm and traditional crafts village can seem like a return to the past. Really, it's a demonstration of a simplified present.

About 30 families belonging to a nondenominational Christian church farm 500 acres just north of Waco. Other church members, about 600 total, live nearby and help with the work. Part of the produce goes straight to their tables. Most goes to support the group's businesses, a cluster of shops on the farm's edge.

Clay from the riverbank is turned into hand-thrown pottery. Wheat is harvested, milled and becomes bread and pastries in the deli. Sorghum becomes syrup to sell. Tomatoes are made into salsa. Wax from honeycombs become candles.

For visitors, it's a chance to watch as the crafts are made and then buy the fruits of the farmers' labors.

The workshops are on gravel paths set among the trees. All were handmade by Heritage members. Several are restorations of buildings moved from elsewhere. The flour mill, still being finished, was built around 1750 in New Jersey. The church moved it to Texas in pieces and is reassembling them. It's operational, but the water wheel won't be completed until about Thanksgiving.

The group is so adept at quality construction that it built President Bush's house in nearby Crawford.

The showplace for the crafts is the Barn. A restored farm building of wooden planks and stone, it has everything from handmade furniture to herb-scented soap, candles and books on raising chickens and ducks.

On display is perhaps the most beautiful rocking chair you'll ever see. (And at $6,000, one of the most expensive.) The slats forming the back are amber with dark streaks. The tag says it's solid curly maple, but it seems impossible that anything that smooth and polished was ever part of a tree. The seat is leather. Admirers approach it carefully and sit gingerly. Then they relax into it and don't want to get up.

Upstairs is a handmade guitar. A handmade wooden canoe gleams from a banister.

These were made in the woodworking shop about 50 yards from the Barn. Master craftsman use hand tools and traditional methods to make the furniture. They'll gladly explain their method and talk wood.

What crafts you see depends on what day you're there and what's being made. Even on a slow day, there are plenty of people to answer questions. One woman quickly left the sales desk to answer questions about a loom, even though the shop was busy.

The busy times are during the Labor Day Sorghum Festival and the much larger Thanksgiving Festival, the three days after the holiday. Special exhibits and booths are set up to handle the thousands of visitors who browse through the trees.

Almost every day, Jenni Fritzlan, 23, throws clay pots. Sometimes she produces small jars so alike they could have been made by machine. Other time is spent on original items, such as a five-gallon water jar.

Adults, children, even teens watch absorbed as she expertly uses her hands to shape a small urn. Within minutes, she has turned out several of the pots. At long tables nearby, several girls work on their own pots, more slowly and with less grace. Jenni started that way when she was 10.

It's that opportunity to give their children time to learn a craft that is a primary reason for Homestead Heritage.

"We try to help our young people find their gift and their calling," said Paul Sellers, a woodworker from Great Britain who lives on the farm. He designed the rocking chair for sale in the Barn, but younger men trained in the farm's woodworking shop now produce it.

Their calling could be farming, construction or cooking. But it could also be accounting, administration or graphic arts, Mr. Sellers said. "We need those, too."

The church members moved to the farm about 16 years ago, searching for a more meaningful life. "We came to the point that we wanted to simplify our lives in some way," Mr. Sellers said. "A lot of times we want to separate our work from our lives."

But work should be a part of life, Mr. Sellers explains. Relationships should form around work. The group uses horses to farm, not because members disdain tractors but because it allows relationships to build among the farmers.

"With a tractor, one man could farm the land. But with horses it takes six or eight. They work together and build a relationship," Mr. Sellers said.

The Robertson family from Houston has visited Homestead Heritage several times, drawn by that feeling of relationships.

"It's just a fun place to visit. My father actually made syrup from sorghum, so this has some meaning for us," said Dave Robertson. He and his son, Patrick, watched Ms. Fritzlan throw pots at the Labor Day Sorghum Festival.

During the festival, a horse circled the press, providing the force to squeeze the liquid from sorghum grown on the farm. It runs underground through a pipe about 50 feet into a 10-foot-long rectangular

metal cooking vat. Young women, their long hair done up in complicated buns covered with cotton scarves, chat as they use long scoops to skim foam off the syrup. When it thickens, it drains into a bottling shed. During the festival, you can get fresh syrup drizzled on warm cornbread. The cornbread is made from corn grown and ground on the farm.

After you've watched flour being milled, chatted with the blacksmith, learned about the uses of the herb yarrow and visited the model homestead, it's lunchtime.

Some people make the drive to the farm just for the food. The deli serves sandwiches and pastries made with wheat grown on the farm. There's homemade ice cream for dessert. (The sorghum pecan flavor is different and delicious.)

End a visit with the hayride. Often a young boy will drive the draft horses while his father answers questions about the farm. Then hop down and take in the view from the bluff overlooking the river. Listen to the quiet and breathe in the scent. It's a good day.

Karel Holloway is a freelance writer in Terrell.

When you go
HOURS, GETTING THERE

Homestead Heritage traditional crafts village is open from 10 a.m. to 6 p.m. Monday through Saturday. Admission is free.

Take Interstate 35 south to FM 308 (Elm Mott) exit. Go west on 308 for three miles, then north on FM 933. Drive 1½ miles, then go west on Halbert Lane. The farm is a quarter-mile straight ahead at 608 Dry Creek Road.

CONTACT
Homestead Heritage, Halbert Lane, P.O. Box 869, Elm Mott, TX 76640; 254-829-0417; www.homesteadheritage.com.

Time to Rekindle Local Currrency Concept; from Berkshire Trade and Commerce, June 2004
By Susan Witt

Those of us living in the Southern Berkshires realize how lucky we are to have the complex of locally owned stores and restaurants that help shape our community. Main Street hums with activity. Consumers know that Great Barrington shops are unique to the Berkshires; a welcome change from the monoculture look and products of franchises. Visitors are surprised by the originality; regulars are proud and loyal patrons. The owners and clerks and
chefs and waitpersons are our neighbors and friends. We sit on school boards together, gather at town meetings, and stroll past each other on the River Walk. Our youth prefer to spend free time on Main Street rather than at the mall. They experience and contribute to the vibrancy of our "downtown."

Part of what has led to this successful local entrepreneurship is an informed citizenry who understands that keeping dollars local supports the cultural, environmental, and social fabric of the Berkshires. They ask for locally grown food at restaurants; they make weekly visits to the farmer¹s market as a household ritual; and they hire local professionals before distant impersonal firms.

Another factor in the success of our local businesses is the plethora of still locally owned and managed banks in the Berkshires. With all of the changes in regulation and the consolidation in the banking industry, a handful of local banks remain in our region‹an important resource for the health of our Berkshire economy.

One of those quintessential local bankers, Eugene Hannon, died at the end of April. He was an active

member of the Southern Berkshire Chamber of Commerce, a member of the Great Barrington Rotary Club, an advocate for affordable mortgages for first-time homebuyers, and a champion of lending opportunities for the growing Hispanic population. I have my own favorite memories of Gene relative to the development of a local currency for the Southern Berkshires.

In 1989 Frank Tortorelli, the owner of the popular Great Barrington Deli, turned to Gene for a bank loan to renovate a new site for his restaurant. Bank regulations were getting tighter. Frank's figures didn't compute, and Gene had to turn him down. Frank then came to the SHARE loan collateralization program that I managed at the time and asked for help. We told him that he didn't need our group of local investors because he already had a strong customer base and he should turn to them for a loan through pre-sales. What emerged were "Deli Dollars." Frank sold each Deli Dollar Note for $8, redeemable for $10 worth of Zonker Harris and other colorfully named sandwiches once the new space was open. He raised $5,000 in 30 days, repayable not in hard-to-come-by federal dollars but in product. The Deli Dollars were dated over a year's time so they would not all come due the first month of operation and so cause a cash-flow problem. Frank had structured his own loan repayment schedule.

Gene Hannon was one of the first to buy a set of Deli Dollars. A loan for Frank's Deli wasn't bankable under current national standards, but this local banker knew that Frank's community credentials were excellent. Frank would be there to make the sandwich when the note was redeemed.

Berkshire Farm Preserve Notes followed, jointly issued by two farm stands, Taft Farms and the Corn Crib. A head of cabbage replaced the head of George Washington. The logo read "In Farms We Trust" rather than "In God We Trust." We had created a "Berkshire Farm Preserve Note" rather than a "Federal Reserve Note." And we all had fun doing so.

In May of 1991 the Deli Dollar was front page news in The Washington Post with a story of "Yankee Ingenuity." ABC, CBS, NBC, CNN, and Tokyo TV all traveled to the Berkshires for prime-time stories of these Berkshire currencies. Gene had to tell and retell on camera why he couldn't make the loan but would support the Deli by purchasing Deli Dollars. In the process he became a spokesperson for our small local businesses.

In the summer of 1992 seventy Main Street businesses got together through the Main Street Action program of the Chamber of Commerce to issue BerkShares. During a six-week period BerkShares were given away to customers shopping in the participating stores‹one BerkShare for every ten dollars of purchase. Every store signed the back of each BerkShare before it was issued so that we could track the source. Then, during a three-day period in the middle of September the BerkShares could be redeemed at any of the participating stores. We attempted to have a standard redemption policy, but the stores had differing needs. Most stores accepted BerkShares as payment for 20% to 50% of the cost of any item. The Snap Shop on Railroad Street understood that we were introducing a local currency that would benefit the whole community and therefore permitted 100% redemption. Some lucky folks collected enough BerkShares to purchase that long-dreamed-of new camera.

There was a spirit of festivity on Main Street and in the larger community. Second-home owners called their year-round neighbors to say, "I can't make it up for BerkShares weekend, so please go to my kitchen and on the shelf over the sink you will find a stack of BerkShares. Get something nice for your kids."

Over seventy-five thousand BerkShares went into circulation, representing three-quarters of a million dollars in trade. Twenty-eight thousand were used in a three-day redemption period‹a remarkable return on a give-away item.

With that success in place, the BerkShare committee of the Chamber called a meeting of banks to discuss issuing BerkShares at the holiday period. A similar program was implemented in several prairie communities on the Canadian border. In November these prairie banks launch a 0% interest loan program for holiday shopping. The loans are made in a local currency to insure that the purchasing remains local. The local money cannot be spent at chain stores or for catalogue or Internet shopping. The banks and merchants thereby create a local economic tool to encourage support of small regional businesses. Local merchants redeem the notes at the participating banks at 97 cents on the dollar, thus sharing the cost of the program with the bank.

At the meeting it was Gene Hannon who said, "Why are we putting time and energy into another short term issue? Why don't we just work for a year-round local currency?" I remember asking him how he thought such a program would work. He suggested a ten percent discount note. Consumers would purchase BerkShares at participating banks for 90 cents each. Participating merchants and producers

would accept BerkShares at a dollar equivalent in payment for goods and services. As long as the BerkShares stayed in circulation‹for change, partial payment of salaries, and purchase of goods‹they would keep full dollar value; however, when merchants accumulated too many in their cash registers, they could redeem the notes at their banks for 90 cents on the BerkShare.

Purchasing BerkShares would be a citizen's way of voting for local businesses and keeping money local. Non-profits might purchase a $10,000 block of BerkShares for $9,000 and then sell them to their members at full value as a way of fundraising and as a way of showing that a healthy local business economy is deeply connected to a healthy arts, environmental, educational, and social services community.

Gene Hannon's challenge to introduce a year-round local currency has remained tucked in a draw since that meeting, but the E. F. Schumacher Society is pulling it out and dusting it off in the face of the powerful impact of the global economy on all local economies. The Society has undertaken a campaign to raise first-year funding for such a program. Much work is ahead. It will mean reconvening the business and banking sectors for their input and advice as to how to shape such a program. It will require the cooperation of concerned consumers.

In order to bring as many resources as possible together around the history, theory, and practice of issuing local currencies, the E. F. Schumacher Society is organizing an international conference at Bard College in Annandale-on-Hudson, New York, titled "Local Currencies in the Twenty-First Century," to be held June 25-27. Bernard Lietaer, Margrit Kennedy, Edgar Cahn, Paul Glover, Richard Douthwaite, Thomas Greco, Michael Linton, Mary-Beth Raddon, Michael Shuman, and other leaders in the local

currency movement will speak. The event is co-sponsored by many groups including The Nation Institute, The Utne Reader, Acres USA, NOFA Mass, The Ecologist, Coop America, The Orion Society, Investor's Circle, BALLE, CELDF, Center for Community Futures, Institute for Local Self-Reliance, Resurgence, Time Dollar Institute, Ithaca Hours, E Magazine, Dollars and Sense, New Economics Foundation, Maine Time Dollar Institute, Hawthorne Valley Association, and Chelsea Green Publishers. Honored guest Pete Seeger will close the event on Sunday with a Local Food Fest and Concert.

http://www.localcurrency.org.

After the letter are "miscellaneous notes" which is 3 pages of info I prepared for a group to consider in their planning and startup of their own cooperative. I am sending it here in case anyone else out there is thinkg about starting their own local food organizing campaign using the "Oklahoma model" of a cooperative with both producers and customers as members.

As part of our organizational startup, we have been developing an online Local Food Cooperative Management System, which has these features, which interact with each other::

databases of members, routes, trucks, products and prices
shopping cart system
automatic invoice system for customer and producer invoices
automatic route information system
labels (for mailings, for products)
summary total pages for producer and customer revenues
automatic creation of printable PDFs of our price lists
automatic creation of printable invoices for customers and producers
administrative pages that show links based on permissions (some people can see everything, others can only see what applies to them)

The board has voted to make this software available for no charge under the General Public License system, which means it can be used by anyone we give it to, everyone who receives it has full rights to give it away, enhancements that others make will be shared through the system. We are presently guestimating that it will be ready to replicate in other states in July. We still have 25 or so pages of gee whiz thingamadoodles that we want it to do. Our software designer, Emma McCauley of Red Earth Design, is doing a fantastic job on it. So if you decide to start something, we can give you an assist.

We would also be happy for individuals or groups from other areas to visit any of our activities.

Robert Waldrop, Oklahoma Food Cooperative
www.oklahomafood.org

Dear Arkansas neighbors,

I am sorry that I cannot be with you for your first Arkansas Food banquet. I wear several hats and each "hat" comes with responsibilities that I can't always finesse so that everybody is satisfied. Nevertheless, I wanted to write y'all and give you my

congratulations on your decision to enter this great local food adventure. We in Oklahoma have set out to build a cooperative business that is socially just, environmentally sustainable, and economically viable. Each of these three aspects of our business plan is critical, we call these our Core Values. I encourage you to think about the core values of your organization, identify them early and often, and build your cooperative business around your shared values. This is not just about making money, and it is not just about being green, and it is not just about doing justice. It is about all three, three sides of an equilateral triangle, proving that a successful business can flourish and prosper on a foundation of these community values.

There are several unique aspects of our developing cooperative business. From the beginning it has been a challenge to identify and then work through the various issues, opportunities, and problems. Including both customers and producers in the same cooperative organization has worked very well for us. We the Oklahoma Food Cooperative act as agents of both the producer members and the customer members in making a convenient local food marketplace available. For the producers, we list their products, collect the orders and the payments, pay the producer and deliver to the customer. For the customers, we find products for sale that meet our established criteria, provide a way to order and pay for them, and then organize and deliver their order for pick-up at one of our regional depots or for home delivery if available in their area. A

producer in Kiowa County in southwest Oklahoma can sell his or her products in Green County in northeast Oklahoma, and a member in Tulsa can buy from producers in Waynoka.

Starting a local food cooperative is fun. You never know what will happen next. Our Delivery Days are hard work, but they are also becoming social occasions. It reminds me of the social time after church on Sunday in a rural community – farmers standing in the shade, talking about the crops, the weather, the government.

Creating a local food system from the ground up is a lot of work. It is probably more work than we thought in the beginning, but it hasn't been impossible work. We have now had seven monthly Delivery Days, and have moved more than 10,000 items with a total value of $47,993 through our system, November 2003 through May 2004.. One thing that lightens that load is that the results are so tangible, both in terms of economic advantage for the producers and good nutritious food for the customers.

Growing a cooperative local food marketplace adds quality to the lives of all the participants. The food in fact does taste good! On a recent delivery day, a member of my church walked through the sorting area (we use a large hall at the church where I am director of music for our delivery day sorting), she saw a bag of green onions – and they were perfectly green, with a nice perfectly white bulb. She picked one up and exclaimed,

"My God, where does this come from? I have never seen a green onion like this" Okemah, as a matter of fact, is where those onions were grown. My bad cholesterol has gone down 50 points since I stopped buying supermarket meats and started buying meats, eggs, and poultry direct from Oklahoma farmers. It takes me 20 minutes to order 90% of my groceries for the month. The members of the Oklahoma Food Cooperative are enjoying excellent food, food that is healthy and nutritious (with all the benefits that derive from that), AND we are saving time. More than one member has told me that they are also saving money, which has been my experience with local foods. Producer members benefit from a new source of revenue. Nobody's paid their mortgage off yet with Oklahoma Food revenues, but several producers have indicated that their Oklahoma Food sales are significant to the continued viability of their farming operation. When somebody tells you in February, "You made my land payment this month," you know you are doing good for people who deserve a break.

There ain't no such thing as a free local food cooperative (TANSTAAFLFC). We applied for a big grant and a little one, we got the little one, didn't get the big one.. Grants can be useful, but I think it is dangerous if your success or failure is dependent upon a grant. Local agriculture has suffered from being dependent upon outsiders for capital. Self-funding by the participants via the sales of capital shares to the membership is the strongest financial base on which to rest your cooperative efforts. It enforces financial

discipline (which is critical) and prevents us from getting too far ahead of ourselves and from developing excessive administrative overhead. Grants aren't free money, they also cost money and volunteer time for their administration.

The start-up and monthly work of a local foods cooperative involves properly managing a myriad details. Your information and communication systems are therefore critical to your success. We are continuing to fund development of our online Local Food Cooperative Management System, as anything that we can get our software to do is work that cooperative management and volunteers don't have to do. It is better to make capital investments up front in such "smart work" projects than to weary key volunteers and management doing things that computers can do better. Work hard, work smart, as they say. My goal, which I think is shared by the rest of the board and by Emma McCauley, is to make our Local Food Cooperative Management System software available under the General Public License system, where users of the software have the right to give it to others, and where any enhancements if shared with the public must also be freely given to others who use the software. As more groups use and develop the software, all of us will benefit. "Freely you have received, freely give."

The success of a local food cooperative is entirely dependent upon the willingness of the membership to take responsibility for the work of the cooperative. People should not think of this as a typical business where the "customer" is "served" by "employees", but

rather as a house in which they are developing sweat equity. At this stage in our development, we have no paid staff, only volunteers, including all of our management and administration team, and we use borrowed space. We are all members of this organization together, and each of us is responsible for its success.

We are committed to open cooperative membership and democratic governance. Any customer or producer can join the cooperative, and all members are equal, producers and customers alike can buy and sell. If a customer member has surplus produce, they can sell it through the cooperative. We are opposed in principle to limiting the number of producers who can sell a particular item, and we think such limits are also a bad idea for the economic vitality of the organization. Just as in a regular supermarket, producers compete against each other for customer dollars, and that is healthy for the producers and for the customers. Product inventory continues to be a challenge, especially with certified organic vegetables. By having several producers in product categories, we can often suggest substitutes if one producer runs short of a given product.

Those are some ideas for you to think about. This is a big job you are undertaking, but it is not an impossible job. And the rewards are tangible and abundant. On behalf of the Oklahoma Food Cooperative (and also the Oscar Romero Catholic Worker House community, which is one of my other "hats"), I extend to all y'all our very best wishes and hopes and prayers for you as this journey begins for the Arkansas Food Network. We start

small or we don't start at all. Just as two heads are better than one, two states doing local food cooperatives are better than one. We hope to learn from your experiences, just as you have the opportunity to consider our experiences (successes and failures) as you develop your own local Arkansas marketplace. It will probably take us at least 3 years to get our cooperative businesses on a truly sustainable foundation, the sooner we start, the quicker we'll get there. We look forward to years of fruitful cooperation between our organizations.

I should also mention that starting a cooperative like this is a scary endeavor, because if you build this marketplace, the people will come. We didn't know nothing, not a thing, in November 2003 when we hung out our shingle and even so that month we sold $3500 worth of good Oklahoma food. And then most of those folks came back the next month and ordered again, and new people joined us, and we are still growing. We make things up as we go along as necessary, but we are developing an increasingly firm foundation for our business that is rooted in our Core Values as applied to actual real life experiences and successes.

And so I pray that Almighty God, Creator and Lover of the Bounty of the Earth, will bless all of you in your journeys, your opportunities and your challenges, your hardships and your blessings. May your families and your fields be filled with joy and abundance, and may your work together as faithful and prudent stewards to build this new food

cooperative be fruitful and a blessing to all of the people of Arkansas. May we all together as friends and neighbors have the courage to change the things we can, the serenity to accept the things we can't change, and the wisdom to know the difference. Amen..

Yours in solidarity and cooperation,

Bob Waldrop, president, Oklahoma Food Cooperative and founder, Oscar Romero Catholic Worker House

PS. When you think about marketing, remember this: all you really have to do to get a new customer is to put a plate of good Arkansas food in front of them, hand them a fork, and say, "Y'all bon apetit, you hear?" You will be where people will go when they want the right eats in Arkansas. Get ready for it.. They're coming. Local food is the next big thing in food.

MISCELLANEOUS NOTES

Cooperative StructureWe set up our cooperative structure in such a way that it is basically impossible for someone down the line to throw money at us in order to take us over and convert our cooperative organization into something else. We believe strongly in the principles of cooperative enterprise, and have structured things so that there is a

close relationship between the price of a share of our cooperative and the value of our cooperative. We don't want our membership's ownership to be nominal, but to be real. Thus, one member household – one share – one vote. We do not intend to ever issue additional classes of stock. If we need more capital investment, we will either grow the cooperative, or borrow the money or ask the members to vote an increase in the share price. The purpose of the share price is not to raise operating funds, but rather to fund capital expenditures for equipment, software, and other things necessary for the startup of the cooperative (licenses, fees, etc). Our operating funds are effectively "volunteer sweat equity and borrowed space", with some expenditures for volunteer benefits, postage, some fees, etc. The cash expenses are covered by the co-op charge.

Cooperative Charge

We add on $3.50 to each customer invoice for the cooperative, and we also can include a transportation charge, presently a flat $1.50, and a fee for home delivery. In the future, as we develop more history and get a good handle on what our monthly expenses are as the software development completes and our systems fully operational, we will switch to probably a lower flat fee plus a percentage of the order.

Customer Delivery Code.

We really like the Customer Delivery Code that we developed. Each code has four parts: Regional sorting hub – member number – route designation and whether pickup or home delivery – truck number

My personal code is OKC-004-OKCNWP–000

which means: this product is sorted in Oklahoma City, for member Number 4, who is on the Oklahoma City NW route, picks up his groceries, and those groceries don't have to go anywhere on a truck because they are picked up at the sorting site, which is also the OKC NW pickup site. If I was in Norman the first three digits would be NOR and the last digits would be NO1 or NO2.

Postal Mailings.

Print and mail as little as possible. We charge a monthly subscription of $2 to anyone who wants or needs to receive a paper mailing via the post office. Nobody has complained about that. The principle is: "activities finance themselves". Don't mail to everyone every month. Copying and postage will hundred dollar you to death.

Communications

Do as much on the internet as you can, but you also need personal interaction. Use the internet to send out product information, price lists, etc., information that would cost a lot of money to mail in hard copy format. We have two listservs, one with all the members, one for only the producers. These are announcement only listservs, not discussion groups. We have one discussion group that is fairly active.

Definition of an Oklahoma Food Product was Problematic.

The definition of what is eligible to be sold through the cooperative turned out to be one of our greater challenges. It seemed so simple in the beginning, "Oklahoma foods". Everyone knows what that is, right? But the question immediately asked was, "What is an Oklahoma food?" We ended up deciding that an Oklahoma food "eligible to be sold through our cooperative", is something that is raised or grown within the state, or if it is a processed product, it is made within the state. In both cases (primary and processed products), we decided that they had to be sold by the producer, we accept no "distributorships" as members. Also, because many of our customer members join the cooperative because of ethical and moral concerns about Confined Animal Feeding Operations, we say that while ingredients for processed foods and products can be bought from the commercial system, any meats or poultry must (a) originate within the state of Oklahoma and (b) cannot derive from a Confined Animal Feeding Operation. Whatever you decide about the definition of "Arkansas Food", set up a procedure from

the very beginning to review new products to ensure that they meet your requirements. (It is easier to keep something you don't want out than to de-list something once it is already in the public price list.) One of the benefits of joining the cooperative for customers is that the cooperative does this kind of basic product review so they are assured of the local origin and they know the production practices of the particular product. You don't have to be certified organic or all natural to sell through our cooperative, you do have to declare what your production practices are. We also decided to sell non-food items as well as food, and that is a growing category of our product line. We require that processed products include an ingredient list, and that producers note any that are of Oklahoma origin. Some processors have changed product ingredients in order to qualify their product for sale through our cooperative. And there is a small but growing trade among the producers. Some of our chicken producers buy certified organic feed through the cooperative, another producer who bakes bread and grinds flour and cornmeal gets those certified organic grains and corns from cooperative members. We the Cooperative like that a lot and strongly encourage it.

Delivery Day Procedures

Each Delivery Day we have changed our work procedures, but we are getting to the point where they have about stabilized. The one innovation for June will be using totes for each customer. We went to this a bit reluctantly, as that is an added expense ($5/each), but I

have been persuaded by the actual work that they are necessary. Each month we have had some items go astray and often it is because when one order as bagged for delivery, some of the order items sitting next to it that belonged to a different customer were picked up by mistake. Delivery Day mistakes are a Big Problem because they require a lot of personal attention from the cooperative administrative team. Thus I am willing to go many extra miles, even if it costs money, to minimize those mistakes, because the volunteer time is itself a limited resource. Even though we are all volunteers, we have to think about how much time and work we are asking from people, just as if we were paying salaries. "Volunteer" does not equal "Limitless".. Our Delivery Day system works because one day a month a delivery system comes together. But it's not there "the day after" until the next delivery day, so anything that misses the truck and goes astray on Delivery Day is a problem often without an easy solution. (The ease of the solution depends on the geography of the problem.)

Our present Delivery Day work procedure is to set up tables around the perimeter of the room, and we lay the customer invoices (2 copies of each) on those tables, sorted first by route, then by member number. Ice chests are also arranged around the room, typically 2 or 3 members per ice chest, with some exceptions (some members require a whole ice chest for their monthly orders). When a member's product goes in the ice chest, the member's name is put on tape on the lid of the ice chest.

We started out by putting the producers' products on the perimeter, and picked each member's order individually, but our present method is much more efficient and has fewer problems. We have also tried arranging the producer invoices in simple member number order, and then when the orders were checked, they were moved to a staging area for its delivery route. But that method involves one extra movement of the orders, and we are trying to minimize movement of the orders as a matter of efficiency and frugality of effort. Believe me, when you sort nearly $10,000 in groceries into individual customer orders, you will become very interested in frugality of effort.

When the producers bring in their orders, we have three tables up front and the producers' orders are first checked in. If anything is missing, a "Missing Item" ticket is filled out, one copy for the customer's order, and the producer's invoice is marked with what is missing. In June we intend to use four producer check-in stations.

After the product is checked in, the producer assisted by volunteers distributes the items to the appropriate member places on the tables. Products for Tulsa and Tahlequah and Norman, which are sorted in those areas, go to their staging areas, where their volunteers bag things and load them for transport. In June, there will be totes on the table with the member's customer delivery code on it.

After all the producers have arrived, and all of the product is distributed, we check each order, and it is bagged. Customers then come and pick them up or they are transported to other pickup areas. If there are any discrepancies on delivery day, the customer's invoice is adjusted. We lay out two copies of the invoice when we set up, and the corrections are made to both copies. One copy stays with the customer's order, the other copy goes to the treasurer. (The treasurer has a table at the front, staffed by two volunteers).

Decision Making and Information Flows.

You need a streamlined decision making process and a clear description of who is responsible for what, and how and where the information flows, is archived, and is retrieved. We're still working on that.

Charge More Rather Than Less for Membership.

Because we got the small grant, we charged a little less for a membership share because I figured we would have the grant money available. Oops, as it turned out, we probably aren't able to use all the grant money. We applied for it when we thought we would open a store, so the money was programmed that way, but we ended up with a delivery system, and the budget didn't fit the new needs. If I had it to do over, we would have calculated our share price as if we had no other funding source. This was not a fatal

mistake, we are doing more than OK, but we probably should have charged $75 for our share price instead of $50. Everything always costs more and takes longer, so whatever you decide to charge, add 20%.

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True community food security - to my way of thinking – would include three main criteria.

1. All members of a given community can afford to buy nutritious food and have access to it (stores that sell nutritious food in their neighborhoods, or CSAs, or farmers market - better yet, all three).

2. All members of the community have sufficient knowledge of nutrition to make good decisions about their food. They know what foods support health, and they understand the value of a varied diet of whole, natural foods.

3. A large amount of the community's food is produced locally. For this purpose, I'd define 'locally' as being within a circle having a 100-mile diameter. (But the more local, the better.)

Even in the colder areas of the USA (with the probable exception of parts of Alaska), large amounts of food can be grown *without* using huge amounts of energy - by the use of cold frames, unheated or solar heated greenhouses, and other modern gardening/farming practices in some cases.

Food can also, of course, be stored for winter use (the use of cold storage as in root cellars, freezing, drying, canning).

Not all places can grow all foods, of course. We're not going to grow oranges or bananas in my area of northern Pennsylvania without a considerable expenditure of energy. On the other hand, we can certainly live without oranges and bananas (although I enjoy both).

I live in the Appalachian Mountains in northern Pennsylvania. What food is actually grown commercially in this rocky, poor-soil, short-season, steep hilly area of the USA? In any quantity - just milk and maple syrup. And the dairy farmers are a dying breed here, as in many areas of the USA.

***Without* special cold-protection measures, in this area we can grow apples, blueberries, gooseberries, strawberries, raspberries, hardy kiwi, grapes, jostaberries, blackberries, rhubarb, elderberries, probably pears, and likely other fruit that I am forgetting. With unheated or solar-heated greenhouses or hoophouses (poly tunnels), there are even more fruits that we could grow.**

Any number of vegetables can be grown here - I grow over 50 varieties of vegetables and herbs in my garden. I don't have a hoophouse yet, although we will be building one this spring. It will enable me to extend the growing season at both ends, and to grow more and better tomatoes, peppers, and eggplants (heat-lovers that tend not to thrive in our fairly cool summers otherwise).

Various grains could also be grown here - wheat, barley, corn, oats, rye, buckwheat and millet. We can grow legumes here, including soybeans. In fact, corn and soybeans are both grown on local farms but they are used for feed for dairy cows, and not primarily for human consumption.

Our area produces and sells a good deal of maple syrup, and it produces some honey. You can raise sheep, goats, cows, chickens, ducks, and turkeys here - and the feed for them too.

We'd be somewhat limited here by the terrain: mountains aren't the easiest place to grow field crops. But it can be done and in fact it *is* done in many other countries.

Growing a variety of foods locally would provide much needed employment and would ensure the freshness of fruits and vegetables. The produce in supermarkets here is

usually of pretty poor quality: often wilted and obviously past its prime.

We could easily live on entirely locally-produced foods. There would be no reason to exclude such things as spices, dried herbs, citrus fruits, bananas, and pineapple. But it would be good to know that our area is food self-reliant and produces much of our food.

It would be good also to know that our food isn't polluting the atmosphere by being transported an average of 1500 miles from farm to consumer. And it would be good to know that all members of our community can afford to eat good, healthy food. That would be *true* community food security.

Pat

The New Micro Eco-Farmers

This is Chapter One from by Barbara Berst Adams' recently published book, "Micro Eco-Farming: Prospering from Backyard to Small Acreage in Partnership with the Earth." See the end of article for purchase information.

"I love co-creating with the earth, as it is so simple and healing to live close to the mother earth that sustains and nurtures me every day with her beauty. I love to hold her in my hands and watch the seeds grow into fullness just by tending to them slowly along with the sun and rain," says Mariam Massaro of Singing Brook Farm of Worthington, Massachusetts.

On less than an acre, Mariam Massaro tends certified organic herb, vegetable and flower gardens, which include more than 78 varieties of roses. Along with this, she raises Icelandic horses, llamas, Angora rabbits and Icelandic sheep in the farm's Berkshire Hills setting of western Massachusetts.

The animals provide offspring and specialty wool for Mariam to create fiber crafts for sale. They fertilize and mow the gardens. In her 1850s New England farmhouse, a workshop overlooks a year-round brook. The herbs, flowers and wool are processed into products sold both locally and worldwide.

On five acres surrounded by woods, Sylvia and Walter Ehrhardt of Knoxville, Maryland created the successful Ehrhardt Organic Farm. From its earliest years, chefs could not get enough of their organic dessert quality blackberries, which bear up to nine weeks in their location.

Chefs also gladly paid premium prices for their fresh picked, locally and sustainably-grown raspberries, strawberries, miniature squash, carrots, tomatoes, herbs and shallots. Thousands of plants were started each spring in the greenhouse attached to their living room, just a short walk from their growing area.

They grossed $12,000 an acre on miniature squash alone. Their blackberries produced two tons per acre per season. The farm, still going strong, became a demonstration farm as well, and their reputation as successful organic growers spread nationally and internationally. "Over the years, we found that we didn't need to expand our land but to make it more productive," said Sylvia.

Ocean Sky Farm, owned by Art Biggert and Suzy Cook of Washington State, is a 1.55-acre suburban full-time farm. They have operated a highly successful community supported agriculture (CSA) farm where 75 families "subscribe" to the farm by paying upfront for weekly delivery.

Being microfarmers, they can adapt easily to new interests, and eventually chose to incorporate other farm products including perennial medicinal herbs. "People come to the farm, take what they need, fill out their own receipts and leave cash or checks in the tea pot," Art said.

Baruch Bashan, creator of Gaia Growers Farm in Portland, Oregon, had been a part-time vegetable gardener for more than 25 years. One year, he produced 2,000 pounds of vegetables on two city lots. Not needing it all himself, he ended up donating it to the local food bank.

"That last year I decided I'd had enough of working in an office as a software programmer, and wanted to do farming full time," he said. It wasn't until July of that year that he secured a half acre, but still had a successful growing season and launched Gaia Growers Farm.

He was convinced, as he stated, that "a single, hard-working person can run a successful organic veggie and seed growing business on small acreage, without having to invest a lot of money."

There is a change among those who farm in this century. They are not different than what they used to be. They are more of what they always were. Some come from generations of farmers or gardeners. Some have just joined those who earn a living from the earth. Regardless, they seem to have taken a long-lost power back. Are you one of them?

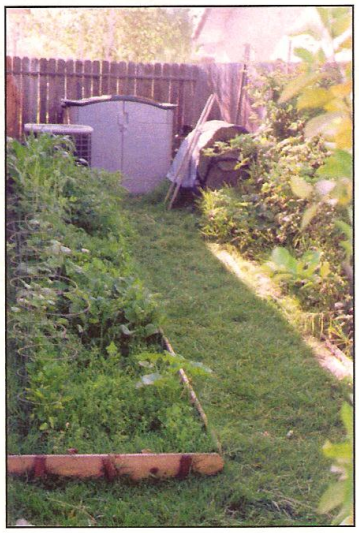
"After 18 years working in the corporate world, I'd had enough," said Robert Farr, also called "The

Chile Man." He owns a ten-acre sustainable farm in Virginia, and here he shares his story with us as he also wrote it for American Farmland Trust Magazine. "I'd always had a relationship with the land, hiking through the Appalachians and the Rockies, and I'd grown up with my hands in the dirt. But faced with the prospect of endless days in windowless cubicles, I decided to live a dream I'd had since adolescence, and start my own sustainable farm."

He continues, "As soon as we closed on the farm (July 1998), in Loudoun County, Virginia, I quit my job as a marketing manager in the computer industry and The Chile Man was born."

He now grows 67 varieties of peppers and other fruits and vegetables to produce more than 40,000 bottles of all-natural marinades, barbecue sauces, mustards and salsas right on his ten-acre farm.

The term I use for this book, "micro eco-farm," sprung from this change in farmers. From urban lots to small town backyards to rural small acreage, this term is the umbrella for highly abundant, constantly improving, ecologically operated microfarms that produce a mix of fruits, vegetables, herbs, grains, nuts, mushrooms, flowers, fibers, craft materials, organic, pasture-fed dairy products, farm-crafted creations, and farming education and experiences.



The examples in this book emphasize farms from fractions of an acre to five acres that earn fulltime income for at least one adult. Some provide the entire income for single adults with several children, and some provide the main income for two adults and their families.

It also touches on microfarms that integrate with complementary home and cottage businesses, those that prosper on six to 15 acres, and a few who earn a supplemental income.

All are sustainable in a variety of ways and are taking traditional organic production to new levels. Whether they reintroduce ancient royal gardening techniques or are the first to profit from the latest U.S. research, they connect sustainable local mini-farming with the care of ecosystems and entire world populations.

Some even say it's as though they are recreating an advanced form of Eden. They are willing to work harder short-term, in order to have more time long-term for further creativity and loving their friends, neighbors and family.

This seems to be just what the earth wanted, anyway: A co-creation of human innovation combined with the earth's superior ability to "do the hard work." Even organic pest spraying, rototilling and weeding will become less and less necessary at the hands of these farmers.

Fueling this new entity—the micro eco-farm—are several supporting changes in human values. These include the environmental and health movement, the delicious "Slow Food Movement" (see Resources and Networking), the push to strengthen local economies and the parents wanting their kids to connect to nature and their food source again.

We now know that large amounts of farm crops can be produced intensively on very small amounts of land very easily and very simply, and as this happens, the land and crops get more abundant year after year.

There are many techniques that allow for this, and yet, micro eco-farmers don't always use just one of them. Often, they will synergize several, to create a new whole much more prolific than the sum of its parts.

Micro eco-farmers do not compete with mass-produced, under-priced products. As one would guess, they supply the niche markets. However, you will soon see that there are more niches than anyone ever dreamed of. These "tons of niches" collectively add up to a very large opportunity for new micro eco-farmers, almost making non-niche farms seem like the oddball.

These micro eco-farms, along with their larger sustainable agriculture cousins and sustainable home gardeners, choose the rhythm of a new drummer—that of the earth as the solution, rather than the earth as the problem. They still touch the soil; they still plant the seeds; and they still nurture the animals.

But, because of the retrieval of their power, they have switched direction, crossing the bridge back home, rather than crossing the bridge far away. No longer running from the earth as one would run from an enemy, forcing and succumbing, they are now moving towards the earth as a source of latent and untapped wisdom.

Whenever they need an answer, the answer seems to appear — such as it did concerning the honeybee problem that began in the late 20th century. Honeybee populations were dwindling. The bees could not, it seemed, sustain their health and numbers, succumbing to parasites and other invasions.

About this time, Adaline Harms had secured her five and a half acres on the edge of Mt. Shasta, in California. Here, she now gardens in her greenhouse and hexagon-shaped raised beds.

Adaline is one of the most spiritual and earth-loving people I have ever met. My conversations with her remind me that whatever created this earth speaks to us in many ways, including directly through the earth itself, even through its own honeybees, if need be…

"I took a trip to Arizona, and while driving on Highway 5 the length of California," she said, "I kept seeing all the bee hives on the side of the road. I just got this feeling that I needed to keep bees. I knew absolutely nothing about beekeeping, so when I got home, I started asking around about beekeepers to learn from."

This eventually led her to someone who had worked with Ron Breland, who has a nursery and bee sanctuary in New York State and who had developed an alternative hive.

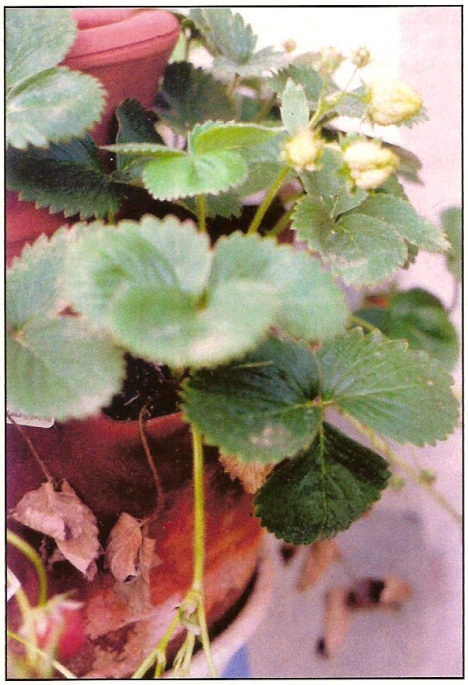
Ron reportedly noticed that in nature, bees don't build hives in the shape of file cabinets. So Ron mimicked nature's design in his hives, and his bees thrived well.

"How quaint," I thought before actually seeing this hive. I imagined something simple. Maybe something Winnie the Pooh would climb up and get his nose stuck into.

"So, Adaline, is it round, hexagon?" I asked. "It's a dodecahedron," explained Adaline.

"A what?"

"A chalice made up of pentagons, with a similar shape turned upside down on top of the chalice to make up the brood chamber, then there are five-sided extensions that stack on top." Adaline had a hive built according to Ron's design and observed her bees gaining strength.



Like Adaline, these new sustainable farmers and gardeners are freer to be innovative again. Without thousands invested in equipment specialized for one specific crop, or fees paid to support large advertising firms that push a crop they are entrenched in, they can change crops, and they can change "equipment," on a summer weekend. The following year, Adaline's carpenter built four more hives.

"We've made a couple of minor alterations to the original design, while trying to stay with the original ideas and intention."

The differences among individual micro eco-farms are many, yet this is their strength. If you are about to become one, you will create something like no other. You may develop a purely vegan farm, supplying those who consume only plant foods with aromas, textures, proteins, micro-nutrients and "life force" in a variety previously unheard of.

Perhaps you'll operate a "Paleolithic farm," concentrating on nuts, roots, wild greens and other foods humans once consumed before grains became a mainstay. Maybe you'll add wild-grazed fermented dairy products as our ancestors once consumed.

In a world dominated by an oversupply of questionable grains, you may even grow grains. But yours may be pre-industrial grains such as spelt or quinoa, grown organically and intensively for higher production on smaller parcels of land, with the grain stone-ground right after harvest, right on the farm.

In fact, you may even sprout your grain before it becomes bread, turning it back into a "vegetable" rather than a grain, to bake into loaves in your farm's own hand-built brick ovens.

Yours may be one of the only farms reviving food of the Incas, such as ahipa — pachyrhizus ahipa — fabales, a legume grown for its sweet, apple crisp roots, or arracacha— arracacia xanthorhizza —apiaceae, which looks similar to celery with uniquely flavored roots, or maca — lepidium meyenii — brassicaceae, with tangy, radish-like roots.

Or maybe you'll operate a farm that provides for Italian cuisine chefs, gourmet hobbyists, or local and online ethnic groups. Your unique herbs and vegetables can't be found in supermarkets. You'll provide those vine-ripened Italian tomatoes even in winter in your 10- by 10-foot greenhouse, while teaming up with a neighbor whose goats fertilize your gardens, and who creates boutique cheeses that complement your Italian sauces sold throughout the winter months.

You may produce products for other farms and gardens: worm castings, heirloom vegetable seedlings, locally-adapted garden flowers, and heirloom seeds, to name a few.

Some farms provide "experiences" even more than products, with a children's pony farm or an herb farm with herb related classes. The selling of experiences works well for those microfarms that attach to larger established businesses such as destination spas, schools, campgrounds or spiritual retreats, which automatically draw in visitors as part of the farm income. However, "microfarms within larger establishments" can also be, well, "microfarms within larger farms."

Theresa and Matthew Freund own a Connecticut dairy farm. When they filled a wagon with their garden's extra-sweet corn on the side of the road, customers stopped to buy, and also asked for lettuce, tomatoes and cucumbers. Following this lead, they planted more of the things they were asked for. Eventually, their farm stand took in $100,000 over the summer, while Matthew and his brother continued to operate the dairy.

The Freunds expanded their roadside stand into a two-story barn-type building offering their fresh produce, dairy products, jams, vinegars, and they even added a U-pick wedding flower acre.

You may be a microfarmer who does not even grow food. Some produce ornamental wheat instead, or herbal goat milk soap, naturally-colored cotton or Angora wool.

"In the U.S., there is a lady who 'paints' pictures using flower petals out of her garden. Another farmer grows seven acres of broomcorn, makes brooms and sells them retail and wholesale," said Ken Hargesheimer, who teaches sustainable mini-farming, mini-ranching and market gardening in the U.S. and worldwide.

"There is a grassroots movement back to family farming," he continued. He has seen for himself what he describes as "free enterprise and micro-entrepreneurship" in both urban and rural environments where mini-agriculture has been proven to produce substantial income on surprisingly small parcels.

"People can have a comfortable income, a high-quality lifestyle, and a great way to raise children," he said. "As well, the micro eco-farm can adapt to year-round work, second-

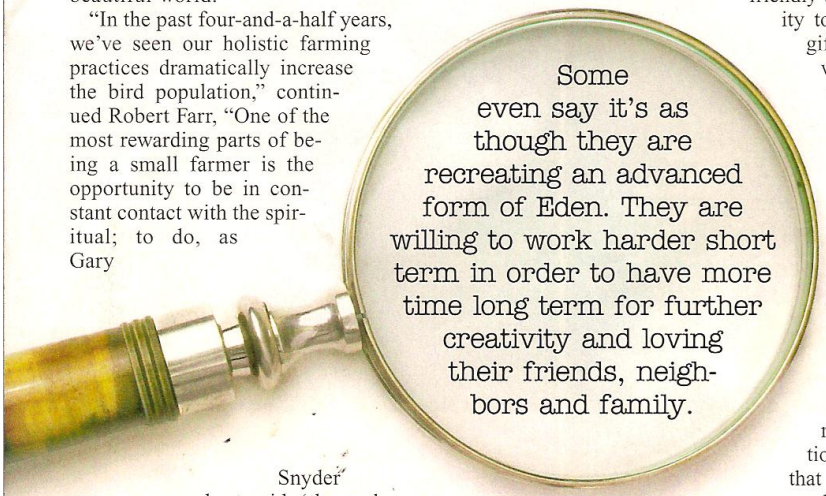
family income, spare-time income, or even full-time income for part-time work."

A lady took a (mini-farming) course," Ken said, "returned to Alaska, prepared her land and grossed $20,000 the first year, and then had a six-month winter vacation!"

Micro eco-farms team up nicely with other cottage industries. Personal chefs can create one-of-a-kind cuisine from their own minifarms. Massage therapists can create their own line of garden-fresh, body-care products. Bed and breakfast inns are very popular when combined with small working farms, each enhancing the customer draw and promotion of the other.

Regardless of their differences, they have one thing in common. They seem to have an inner knowing that creating with the earth is attached to Something Greater than anything purely human-created, and they must continue to work with this greatness. As they do this, their presence on the earth is collectively creating a very beautiful world.

"In the past four-and-a-half years, we've seen our holistic farming practices dramatically increase the bird population," continued Robert Farr, "One of the most rewarding parts of being a small farmer is the opportunity to be in constant contact with the spiritual; to do, as Gary Snyder best said, 'the real work.' I need only stroll out my kitchen door to be immersed in the holiness of nature, to see the mountains, endlessly walking. All of our own sacred nature begins outside, in the worship, as the Amish say, of God's creation."



It often doesn't feel so much like a business separate from leisure and hobby time, and it gets less and less important to distinguish "work" from "play."

"It's a relationship," said Diana Pepper of her 2.75-acre Green Frog Farm in northwest Washington State. Diana reminds me of a "human faerie" and is a living library of earth wisdom. While she and her partner, John Robinson, occasionally wild craft their acreage's native woodlands and meadows, most of their production is on only one-third of this acreage.

Diana and John have established a Pacific Northwest native plant nursery, selling native trees, shrubs and groundcovers, plus herbs and ornamental flowers. They also create small bottles of herbal and flower healing products, kits for massage therapists, offer workshops and private consultation sessions. Both agree they are not separate from their livelihood: "It's 110 percent of who we are," said John.

At this point, micro eco-farms fill in spaces that larger sized farms don't attend to. They use back yards, vacant lots, or their families' own small acreages. As they grow in number, it is anyone's guess as to what type of new economical foundation they could create.

We are currently still dependent on a system that produces a few staple crops on huge acreages that ship these crops across the country and world. Jo Robinson, author and educator, states it well, "We need micro eco-farms, mini eco-farms and maxi eco-farms."

The current problem with food production is not that there isn't enough food, but more that it isn't produced where it's consumed fresh off the vine by the region's own local citizens who are in tune with that Something Greater, making the local growing decisions, choosing the locally-needed adaptations, and keeping the food and revenue close at hand.

When a stable local economy is created this way, distant shipping to and from far away lands becomes a friendly trade rather than dependency. The ability to produce locally is one of the many gifts of the micro eco-farm. And with world travel and technology that allows networking among eco-farmers of all sizes, their successes are mounting at an accelerated rate.

It is my honor to present in the following chapters a close-up of those who are actually succeeding, a treasury of what you can grow, what farming methods you can use, what animals you might like to choose from, and how the farmers reach their markets. I will present an emerging new foundational how-to on growing methods that span all forms of sustainable small farming, no matter what is grown or where the location. Then I will distill many methods that have increased production on small ground from double to up to 40 times that of conventional growing. You can choose which ones you want to explore and incorporate. Mix and match, and see if you can make two plus two equal 10, something you will see demonstrated in Chapter 6. Once you see all that is available to you, as with every farmer I interviewed, you may find that what's inside you is the greatest success secret of all.

"I love to create. I'm strong-willed and muse-driven," said Baruch Bashan, of the above described Gaia Growers Farm. "I got into software, like one does writing or painting. And, as with those other artist-types, having some other person decide what you create ain't quite the same thing as when your Muse calls. So, this allows me to define what is to be created."

It's as though these new micro eco-farmers sense something on the horizon that is beautiful, and they are taking us there. Chapter One of: Micro Eco-Farming: Prospering from Backyard to Small Acreage in Partnership with the Earth.

Dear Mulchers,

We are now tabulating the results of our study of the extent of mucuna use in Mesoamerica (Honduras, Guatemala, and Mexico), being done by Ami Kadar. Some of the information is pretty much what we expected, but some of it is quite interesting.

In general, we have found that the system is alive and well, in all three countries. In Honduras thousands of farmers still use it. Interestingly enough, it is still apparently spreading south into the Departmentof Gracias.

In Guatemala, it is apparently holding its own in the Polochic Valley, but spreading fairly rapidly through the Peten. And in Mexico, it is spreading in a few isolated areas, in Tabasco and Veracruz States. Actually, we were surprised to find a few farmers using it clear up in the northern reaches of Veracruz State.

The most interesting result of the study is that there are a good eight distinct systems in which mucuna is associated with maize, and these systems do seem to vary according to climatic conditions, to some extent. Of course, it was a little difficult to define exactly how we would count the systems (we could have had about 20 systems if we'd been more focused on the differences in planting dates, for instance). What we did to

differentiate systems was to say that, for one system to be considered different from another system, either the maize or the mucuna had to be planted in a different season altogether. For this purpose, we counted three seasons--the early "primera" season, from May to August; the late "postrera" season, from September to November; and the "drier" season, from December to April. Here is the run-down of systems (if any of you can think of some more inspiring names for some of these, let us know):

1. The "Drier Season" System. Here the maize and mucuna are both planted in December-January, and the mucuna grows until the following December. This is the dominant system on the North Coast of Honduras, the Polochic Valley, and much of Caribbean Mexico.

2. The "Chahuitera" System. In this case, the planting dates are the same, but the purpose and location of the system is very different. In drier areas (eg the western part of the Tehuantepec Peninsula), this system is used alongside rivers. Maize is planted using the receding moisture, and the mucuna is largely planted with the purpose of a green mulch--to maintain as much as possible the moisture in the soil.

3. The "Double Maize" System (this name CRIES for a better moniker!). In this case, maize is planted in both December and May, together with mucuna. Interstingly enough, this

system exists in small pockets in all three countries, in the highest reaches of the mountains along the Honduran coast, near Malpaso in Chiapas, and in Chixoy and parts of the Peten in Guatemala. This System should be of particular interest to development institutions, because in some areas (notably the North Coast of Honduras), the mucuna system is losing ground because it is not "intensive" enough--presumably cannot produce two harvests of maize in the same year. The presence of this system in one place after another would seem to solve that limitation.

4. The "First Season" System. This system consists simply of planting both the maize and mucuna in May-June, when the rains start.

5. The The "Traditional Green Manure" System. Here, just as green manures have been managed in the temperate climates traditionally, the mucuna is planted in the first season, then cut down in time for the maize planting in the second season (sometimes as late as November).

6. The "Second Season" System. Both the maize and mucuna are planted in October. Interestingly enough, farmers who practice this system usually practice the First Season System on another piece of land. That is, they have one maize/mucuna system that produces maize in October, and another, on another nearby field, that produces maize in

about January. That way, they never have to store maize more than about seven months.

7. The "Omoa" System. Apparently only used around Omoa in northern Honduras, this system consists of planting maize and mucuna in May-June, and then cutting everything down, so a second crop of maize is injection-planted through the dead mulch in September-October.

8. The "Improved Fallow System". Used both in Cerro San Gil, Guatemala, and in Mexico, this system is basically an improved fallow or rotational system: the mucuna is planted in May, allowed to grow one to two years, and then the maize is planted the following May-June, for a year or two.

A final version (about 40 pages) of the study will be available within about a month.
Roland Bunch

"INTERBAY MULCH"

As an over-winter method for building humus-rich soil, it would be difficult to improve on the "Interbay Mulch" (named after the community garden in Seattle where it was developed) for effectiveness. Interbay-mulched soil, according to lab tests, is "uniquely active". Over a winter, an Interbay Mulch will give you a large volume of humus as well as a rich diversity of bacteria, fungi, protozoa, beneficial nematodes, microarthropods, beetles, millipedes and worms. Living soil is key to successful organic gardening. Grow lush healthy disease and weed free gardens after just one winter.

Interbay Mulch is basically various organic matter culled from the urban waste stream piled on top of your soil and covered with damp burlap. And it's all free! We have found organic matter decomposes faster on top of the soil than it does if you till it in as long as it is covered and kept moist.

Why the burlap?
Covering organic matter with burlap fools nocturnal, light-avoiding organisms into working for you 24 hours a day. Burlap will diffuse and soak up rain preventing it from driving into the mulch; it also inhibits evaporation, keeping organic materials uniformly

moist. Birds are unable to forage in the mulch so worms and other organisms flourish and multiply. Burlap covers the mulch but is also part of the habitat cultivating a rich variety of fungi and providing a home for beetles, spiders worms and the like. Burlap permeability allows needed oxygen to reach all parts of the mulch.

What do I use for mulch under the burlap?
First and foremost the debris from your garden. Chop up your corn, bean and squash plants. Tomato plants, etc. (Many of us don't even worry about seeds because of ongoing top dressing mulches during the growing season. If you are concerned about seeds or diseases, put those plants in the hot composting holding cages) Think the same "brown" and "green" mix used for hot composting, approximately 50-50. The more variety in materials the better.

What are some examples of "Browns"?
Leaves are easily obtained in the fall. Dried cornstalks. Straw is a good brown; even better if it is rotted. You can also add rotted burlap, cotton dryer lint, shredded paper, and season with a few pine needles. Woody material should be limited to rotted material that you can smoosh between your fingers.

What about "greens"?

Practically anything that doesn't burn when you put a match to it. Garden debris, green corn stalks, fresh grass clippings, coffee grounds (leave a bucket at your favorite espresso cart), juice bar pulp, spent grain and hops, seaweed, grape pressings, apple pomace, tea, and so on. Any kind of organic manure is good.

Should I add compost?
Using compost as part of the mix is a great way to get the system jumpstarted. One wheelbarrowfull of rough compost per hundred square feet is sufficient to get things going. Using burlap that was used last year is also a good way to inoculate your mulch. The used sacks are full of dormant organisms just waiting to go to work.

How much material should I use?
Depending on your soil needs, the mulch will be 6 to 18 inches deep. Make sure all materials are damp before covering with burlap.

Do I just walk away and leave it for the winter after covering with burlap?
Check for moisture during the winter. If materials dry out decomposition comes to a halt. You can also feed your mulch during the winter like a worm bin. Adding materials once the mulch is active makes it work even better. You will have fun checking your mulch through the winter. The biology is fascinating. You will have given birth to billions of

trillions of organisms. Some you can even see!

When can I plant in the spring?
If you start your mulch in October you should have rich humus to plant into by March. If you started with 12" of mulch you will end up with 2-3 inches of soil-energizing humus.

Do I till it in or just plant into it?
Gardeners do both successfully.

Mulch Systems - Velvetbean (Mucuna) Maize System

One of the first reports found in the literature on the use of velvetbeans (*Mucuna* spp.) in a slash/mulch system in Central America was by William E. Carter in 1969 describing the use of velvetbeans as a mulch in the lowlands of Guatemala by Kekchi Indians, a Maya group that had migrated from the highlands of Guatemala.

Maize growing through mucuna mulch (mulch being shown by farmers) (Picture courtesy of Roland Bunch)

Planting maize in slashed mucuna mulch with dibble stick (Courtesy Milton Flores - CIDICCO)

In the dry season fields were planted to velvetbeans. Carter wrote that the technique was to dibble a shallow hole and drop seeds three at a time into it, spacing the hillocks some 4 varas (83.5 cm) apart. After two months of growth, velvet beans began to have drastic effects on the *milpa*. Where weeds, grasses, and small trees have begun to take hold, it gradually covers them and chokes them out. Within six months, mucuna yields a thick cover of dark green leaves that can reach up to 8 feet in height. Once the luxurious growth of the velvetbeans reached a height of 2.5 meters the Kekchi slashed the growth with machetes and chopped it up finely. The result was a mulch 8-10 cm thick of the decayed velvetbean vegetation on the soil. Carter claimed that plots planted to velvetbean did not revert to grassland or forest, and that some plots had been used consecutively for 14 years of dry season farming with little indication of diminishing fertility. These observations were an early indication of the possibility of sustaining soil fertility in the lowland tropics with the velvetbean or other cover crop systems for long periods of time with a minimum of inputs.

Mucuna growing over mature maize (Courtesy Milton Flores - CIDICCO)

ng through mucuna mulch
(Courtesy Milton Flores - CIDICCO)

Regarding the system in Honduras Milton Flores of CIDICCO wrote: "Farmers using velvetbean for the first time, plant the legume 1-2 months after planting corn, at the beginning of January. Later on, when corn is harvested, its stalks are bent over and left on the fields. Velvetbean starts covering these stalks and soon the legume will take over the whole corn field. By December the large amounts of velvetbean foliage (varying from 50-70 mt/ha) begin to dry out until it finally ends on top of the ground providing a cover that can be up to 20 cm thick. This means that the next corn crop is planted directly through the mulch. The mulch suppresses weeds and allows an adequate establishment of the corn. During the second year, velvetbean seeds will volunteer from last year and the cycle continues with the planting of a new corn.

Even without chemical fertilizers, maize yields of 2-4 tons per hectare were obtained using the above system, more than double the national average yields for Honduras. Hillside erosion was also reduced in the region. By adopting the velvetbean system, rather than plowing fields, farmers have essentially changed to a more sustainable no-till system.

CIDICCO indicated that velvetbean foliage was often slashed to plant a second crop of maize, and left as a mulch.

More pictures on mucuna (click on the picture for a larger image) :

***Some of the pictures below were prepared by Christine Stockwell or Lucy Fisher.**


Steep hillside planted to mucuna in Honduras (Picture courtesy Bernard Triomphe)


Field of mucuna (Courtesy Milton Flores - CIDICCO)

Immature mucuna pods (Courtesy Milton Flores - CIDICCO)

Three colors of mucuna seeds (Courtesy Milton Flores - CIDICCO)

Organic matter produced by mucuna (Courtesy Milton Flores - CIDICCO)

H. David Thurston
http://del.icio.us/entrailer/H.David-Thurston

This is the site for Milton Flores And CIDICCO their work on green manures/cover crops (GMCCs) and most notably published on maize-mucuna.
http://www.cidicco.hn/newcidiccoenglish/

Maize Mucuna
http://del.icio.us/entrailer/Maize-Mucuna
Notice the Doc Thurston cross-link. His are the best images of the system.

Sustainable Harvest
Here is another group working in your area, in both senses:
http://www.flickr.com/people/sustainableharvest/
this is how I came across them:
http://www.flickr.com/search/?q=intercropping
a keyword search for "intercropping"

Rishi farm of Raju and Shalini Titus

Titus Farm House, Bhopal Road, Hoshangabad—460 001, Madhya Pradesh. rajuktitus@gmail.com

After a prolonged wait and great determination, the family of Raju Titus has finally achieved what seemed to be asking too much from Mother Earth. Today, the Titus family is a proud owner of a small piece of land, totally cultivated according to the hallowed principles of organic farming. When Raju accompanies a curious visitor walking through his lush green farm, he remains silent about his experiment. His plants, trees, grasses, fruits and flowers say it all. Raju has a name for his novel experiment. He calls it rishi farming.

Experiments like rishi farming stand like light houses in the rough and turbid sea of competitions encouraged by the false idea of 'development'. Those who wish to retain their sanity and integrity as human beings, are left today with no choice but to attempt such bold experiments, asserts Shalini, Raju's better half. For Raju and his family, the experiment of organic farming goes much beyond the idea of tilling the land with ecological considerations. Rishi farming is a way of life that involves an enduring commitment of the entire family to a mystical force called nature. It also means an increasing dependence of Raju's family on the forces of nature.

The Titus farm is situated on the outskirts of Hoshangabad, just one and a half kilometre from the city, on the Bhopal highway. Raju and his family live in a small house, surrounded by the farm. A government servant by profession, Raju definitely has green fingers and an unbounded love for nature. This, and his desire to follow a natural lifestyle, brought him to this idyllic place, and an ideal retreat far from the

maddening crowd. For the Titus family, nature is a part and parcel of their experience, not just some thing that it to be appreciated once and then forgotten.

The different kinds of trees whose branches are full of birds of colourful feathers, the rich and varied insect life, the trees wafting the fragrance of guava, mango, and wild berries add an aesthetic dimension to this farm. The idea of this unique experiment did not go down well with many, including his friends. Those who knew what Raju was up to, dismissed the experiment as quixotic and impractical. Raju, by sheer will power and determination, proved his critics wrong. Today the same critics have become his great fans. They have seen the transformation that was brought to the piece of land, once considered to be barren and useless. Today, Raju towers above all the farmers in the vicinity who claim to use scientific methods for cultivation. Raju is a pioneer not only in the experiment of organic farming, but has also dared to use Gobar gas for cooking. The same Gobar gas also electrifies the Titus household. Also to his credit goes the first ever use of jersey cow for dairy farming.

It was exactly ten years ago that Raju got possessed with the idea of organic farming. He did not even know whether this kind of farming would yield any results at all. Raju had seen a unique experiment of organic farming in Rasulia that together with his own initiative in the field encouraged him to go whole hog in the organic way. His journey on that path is unhindered since then. This is inspite of the fact that his 12 acre farm could barely provide a few kilos of food grains in the initial days. This, however, did not deter him. Around this time about, the prophet of organic farming Fukuoka had come down to India from Japan. He stayed with Raju's family on his Rishi farm. This meeting proved to be fortuitous, for Fukuoka taught Raju some secrets of organic farming, and also learned some from him.

The weeds in Raju's farm posed a real problem to begin with. This weed is a kind of long grass that shoots up on any land. Most farmers and agricultural experts look down upon this weed as a harmful parasite. This myth is rampant across the world and the so called progressive farmers in America, thinking it to be a parasite, destroy it. The farmers from Somalia also did the same thing to this long grass. The truth is however that the land becomes barren in the absence of this grass. Learning from this experience, Fukuoka advised Raju to use the growth of the grass to the advantage of his farm. The result is for any one to see today. Raju did not cut this 'parasite', instead he crushed this growth with the help of his feet and spread it across the field. This proved to be good manure for the land. The standing wheat, paddy and masur crop in Raju's farm today underlines the efficacy of this parasite.

Contrary to popular belief, the long grass that shoots up in the farm land is its friend. It arrests the process of soil erosion and protects the top soil which is so vital to the health of the land. The Fukuoka practice of spreading weeds on the land and making them a part of it symbolises the principle of 'offering something to land which belongs to it in the first place', believes Raju.

The weeds or parasite, as this growth is called by conventional farmers, is treated by them as garbage and destroyed. Also included in this garbage are vital organic wastes like plants, grasses, leaves, dead wood, insects, earthworms and various kinds of biological waste. Although dubbed as 'garbage' this is nothing short of tonic for the land. To destroy this is like destroying the life support system of any land. Fukouka's genius lies in recognising this. Raju's success too lies in following this advice faithfully. The crop which has derived its nourishment from the 'biological garbage' speaks for itself on Raju's rishi farm. These days Raju is trying to grow crops under the shade of trees. Surprisingly these crops too look healthier, discounting thereby, the popular myth that nothing can grow without sunlight.

Sowing of the seeds in Raju's farm takes place on unconventional lines. Unlike the majority of farmers, Raju does not follow a seasonal ritual of sowing. His sowing for the Kharif seasons begins much earlier when he covers his seeds with mud. These mud balls are then spread on the field, covered by dry grass and sticks. A great care is taken while these seeds are covered to ensure that some amount of sun light and air reaches them. As the rainy season breaks, these seeds get fertilised and sprout on the bed of biomass, so carefully arranged before. Sometimes, the seeds are just thrown as the first rain descends. More or less, the same technique precedes the Rabi crop but extra care is taken to ensure the adequacy of irrigation. If, for some reason, the sowing is delayed, then sowing of corn seeds as well as cereal seeds is done simultaneously by hand. The strength of this kind of farming lies in the biomass collected in the field over the years. In the initial stages however, this biomass is not enough; over the period of time the quantum keeps increasing, enriching the land in manure and enhancing crop productivity.

It is Raju's experience that this biomass, if not destroyed, accumulates in the field and covers the entire field in a short time. It arrests possible soil erosion and enriches the land with biofertilisers and nitrogen, so vital for the growth of the crop. At the same time this biomass engenders the growth of various insects and earth worms, helpful to the soil. The life cycles of these insects and worms are dependent on each other, they feed on each other: and keep under control, the unnecessary growth of pests that afflict the standing crop. His cereal crop of Tooer, Masoor, and Channa show a remarkable growth in a surrounding where similar crop face the predatory attack of various types of caterpillars.

Earthworms found in the soil of Raju's farm are the real collaborators in his experiment of organic farming. They breed in the biomass produced in the farm and make the soil porous and soft. This increases the soil's capacity to absorb more water and adds up to its productivity. This usefulness of

earthworms is being exploited by some who sell them for a lucrative price in the market. Raju abhors the idea of vermiculture devoid of supportive farming and based on purely profit motive. Similarly he does not subscribe to the idea of high breed variety of earthworms. Raju has also identified a plant in his farm which stays green all over the year and keeps the soil in top condition. Raju's family calls it the 'blessing of Rishi' Any one can observe the steady growth of this plant in his farm.

Today, Raju's family, in addition to enjoying the bliss of organic farming, also enjoys the satisfying statistics that could be projected out of his novel experiment. His results would be useful for those farmers for whom farming is a full-time profession.

Last year, the Rishi farm of Raju yielded 22 quintals of Masoor, and about 8 quintals of wheat per hectare. By any standard, this yield is impressive and encouraging. The figures become more impressive when one notes that not a single paisa was spent on chemical fertiliser and conventional methods of farming. This figure becomes even more impressive when the joy that the Titus family has been enjoying on account of this farming is taken into account.

Today Raju is a free man thanks to his courageous path of organic farming which has freed him from the hassles of buying fertilisers, worrying about irrigation, cutting and destroying the 'unnecessary weeds' and crying over the increasing cost of farming. His Rishi farming has given him an experience which is profitable and satisfying at the same time.

Raju's experiment in Hushangabad has given the label of 'Rishi farming' to similar types of experiments elsewhere in the country. His Rishi farming come very close to Fukouka's philosophy of do-nothingism.

Obviously there is a lot of similarity between Raju's idea of Rishi farming, which shows a remarkable tenderness to the land and Fukouka's farming philosophy based on non-interference with the forces of nature and land.

(Source: Yogesh Diwan)

The Myth of Vegetarianism

Many people can live on a macrobiotic diet which consists mostly of grain. I appreciate the concern for wise agricultural resource use that lies behind this statement. Frances Moore Lappe got us all thinking along these lines with DIET FOR A SMALL PLANET--"ten pounds of grain for one pound of flesh" and all that. But Lappe isn't a farmer and is completely blind to some fundamental facts of resource use. There are real-world situations in which eschewing meat as "wasteful" and growing for a diet "which consists mostly of grain" either ignores potential resources or is a disaster in practice.

Examples:
***You have a sloped field you want to produce food on. Plow it to grow those oh-so-efficient grains to feed people, and it will erode disastrously. OTOH, you can plant fruit trees on that slope, and graze sheep on the mixed-pasture groundcover. Oh, and let's throw in some geese--both they and the sheep are grazers, but select different plant species by preference, hence more efficiently utilize the resource.**

***You have an existing forest. The "efficient grains" point of view dictates cutting it down and plowing. But getting rid of forest has serious cascading consequences. Maybe smarter to turn in pigs and turkeys to forage and fatten on the abundant acorns, leaving**

in place a diverse and valuable ecology? Which can also be used to grow medicinal and culinary herbs, edible and medicinal mushrooms, nuts and berries, on and on.

***You have areas in shrubby growth. You can plow them all--to grow grains--and destroy habitat for countless species essential for ecological balance. [This is not hypothetical fancy--I'm simply talking about "conventional" agriculture here.] Or you can leave that habitat in place, and browse goats there. As long as you don't over-browse, you keep ecological diversity in being while using the space as a food-producing resource (milk and meat).**

I could multiply examples all day, if it would help change the >persistent mantra that grain production is *always* more "efficient," less "wasteful." Wise land use always fits the production model to the existing round/climate/other conditions--never the reverse.

>Harvey in northern Va
>www.themodernhomestead.us

Vegetarianism

The vegetarian myth is disproved. It is often stated that meat produces one-fourth to one-tenth the food that using that same land for a vegetarian diet would produce. That is

not the whole picture. Animals who transform one-fourth of their food into meat transform three-quarters of their food into manures (high value fertilizer if properly managed and used) which is transformed into humus which is transformed into crops for both livestock and people. Organic agriculture recycles everything and transforms inert minerals, air, water and sunshine into increased biota through feeding the microherd a full diet including animal wastes. There is more life created into existence out of the dead planetary chemistry than vegetarians are able to account for with their tired false myth. [Lion Kuntz]

Much of the land in many countries is suitable only for pasture which can be used only to produce meat.

UNA ODISEA DE DESCUBRIMIENTO:
PRINCIPIOS DE LA AGRICULTURA

Nuestra odisea se inició en 1982, el día en que Conrado Zavala, un campesino Hondureño, con timidez nos mostró su experimento. Con su escepticismo en la utilidad de la materia orgánica que habíamos recomendado, él había acumulado una enorme cantidad de abono vegetal en varias filas de su campo de maíz. Las últimas líneas las dejó sin cultivar y sin fertilizarlas para tener un control. En ese mismo lugar allí ante nuestros ojos, había un campo de maíz de 2 ½ mts. de altura y una última fila de maíz con menos de 40 cm. de alto. Ese fue el día que comenzamos a darnos cuenta del grado increíble en que la materia orgánica puede restaurar los suelos.

Paulatinamente, el trabajo en una docena de países nos ha convencido que la gran mayoría de suelos pueden llegar a ser sumamente fértiles. ¿Cómo? Haciendo uso de nuestro primer principio: <u>maximizar la producción de materia orgánica.</u> Sin embargo, el enfoque particular de Conrado era anti-económico. El costo de utilizar aboneras sobre granos básicos excede el beneficio. Pero el abono verde/cultivos de cobertura (av/cc) intercaladas puede producir desde 50 hasta 140 t/ha (peso verde) de materia orgánica con muy poco trabajo: sin transportar el material y sin cortar pedazos o acodadura o sin dar vuelta a los montones de abono vegetal (aboneras). De hecho, a veces, a causa del control de los av/cc de las malezas, los costos laborales netos disminuyen, y además con frecuencia la calidad del suelo mejora visiblemente cada año.

Posteriormente, como a menudo sucede, nos dimos cuenta que estábamos muy lejos de ser los primeros en emplear av/cc intercalados. Gradualmente, entre el año 1985 y 1992, aprendimos que los

agricultores aldeanos del Estado de Veracruz en México y hasta Guatemala, El Salvador y Honduras se intercalaban los cultivos de frijoles terciopelo (*Mucuna pruriens*), caupí (*Vigna* spp.) y canavalias (*Canavalia ensiformis*) con su maíz y sorgo. Para nuestro asombro, estos sistemas, virtualmente todos ellos en lo que se supone son trópicos húmedos estériles, permiten a los agricultores sembrar maíz anualmente por décadas, con una productividad que aumenta al transcurrir el tiempo llegando hasta 4 t/ha. En otras palabras, estos agricultores han encontrado una respuesta ante la agricultura de corte y quema. La agricultura migratoria en gran medida con frecuencia es motivada por una fertilidad decreciente, mayores problemas de maleza, o ambos. Los sistemas de av/cc de Mesoamérica, la fijación del nitrógeno y el reciclaje de la biomasa mantiene la fertilidad del suelo. Los arropamientos de residuos de cultivos y un av/cc que crece dramáticamente reduce el problema de la maleza. Habíamos aprendido un segundo principio: mantener el suelo cubierto.

Los mulches de av/cc proporcionan una serie completa de beneficios adicionales ya que los mismos protegen el suelo de la irradiación y el calor del sol tropical, con eso también reducen la quema de materia orgánica. Los mismos ahorran una tremenda cantidad de trabajo; los agricultores pueden sembrar en el residuo vegetal en vez de labrar el suelo. Estos mulches evitan que el excesivo nitrógeno acidifique los horizontes del suelo superiores. Además principalmente evitan la erosión del suelo, aún sobre inclinaciones de 40%. Entre tanto, habíamos leído la obra de Fukuoka "The One-Straw Revolution."(La Revolución de Una Sola Paja) Sin embargo, su recomendación de cero labranza no pudo convencernos. Después de todo, la mayoría de la agricultura tradicional en América Latina usa cero labranza, pero está lejos de ser productiva. A mediados de 1993, visité el trabajo de EPAGRI en la parte sur del Brasil. Habiendo visitado más de 160 programas de desarrollo agrícola a través de los años, me encontré que este esfuerzo en general no publicado es el mejor de su magnitud que había visto en

América Latina. Literalmente decenas de miles de agricultores empleando tracción animal producían cosechas aproximándose a aquellas en los EE.UU. - con av/cc y cero labranza.
Valdemar de Freitas, el gerente de EPAGRI, nos mostró que el secreto para lograr cero labranza consiste en aplicar cantidades masivas de materia orgánica al suelo. Los agricultores brasileños, después de unos cuatro años de aplicar av/cc al suelo, tienen la capacidad de abandonar las actividades de arado. Son impresionantes las ventajas, en términos de mejor estructura de suelo, reducida compactación del suelo, mayor fertilidad y costo reducido. De manera interesante, los agricultores frecuentemente utilizan av/cc que no son leguminosas para aumentar la biomasa a fin de dejar de usar el arado más pronto. Es decir, ellos gastan el ingreso escaso en el fertilizante de nitrógeno durante tres o cuatro años con el fin de lograr no tener que labrar la tierra más pronto.

El descubrimiento de los brasileños explica porqué los sistemas av/cc con cero labranza en el norte de Honduras y de Fukuoka - producen tan bien, mientras muchos sistemas tradicionales con ausencia de labranza no obtienen esos resultados. Así nosotros agregamos un tercer principio: <u>usar labranza cero.</u>

Con la investigación de EPAGRI y su diseminación de más de 60 especies de av/cc parcialmente para evitar las enfermedades y plagas de insectos, se comprobó otro principio más ampliamente conocido: <u>mantener la diversidad biológica</u>.

El último principio fue descubierto por Martha Rosemeyer, una candidata a doctorado en la universidad de Cornell que hizo su tesis en Costa Rica. Durante varios años, agrónomos trabajando con el sistema de "frijol tapado" en ese país hand tratado de resolver un problema serio de deficiencia de fósforo. Con suelos sumamente ácidos (pH = 4.0 a 4.5), virtualmente todo el fósforo aplicado fue amarrado en este

suelo casi instantáneamente sin que la planta lo pudiera usar. Las recolecciones de los agricultores tuvieron un promedio de 500 kg/Ha. Martha y un grupo de agricultores trataron de aplicar el fósforo al voleo encima del mulche. Los resultados, que se confirmaron en numerosos experimentos adicionales, fueron asombrosos. Los rendimientos de frijol se elevaron entre 1.5 y 2.5 t/ha.

Este fenómeno aún no se le ha dado validez con otros cultivos. No obstante ayudaría a exponer el éxito de los sistemas de av/cc de Mesoamérica, y coincide con el hecho que las plantas tan diversas como el maíz, yuca, y los árboles tropicales tienen la tendencia a desarrollar una masa pesada de raíces alimentadoras inmediatamente debajo de mulches gruesos. Además, tiene mucho sentido: cuando los suelos son tan adversos al crecimiento de las plantas como los suelos ácidos del trópico húmedo, la alimentación de las plantas mediante mulches parecería una alternativa mucho más promisoria. El quinto principio es indudablemente mucho menos convencional: alimentar las plantas a través de la cobertura muerta.

Estos cinco principios disfrutan de una buena sinergia. Por ejemplo, si vamos a alimentar nuestras plantas a través de mulches, seguramente no podemos arar nuestros campos. No obstante, la relación más importante entre estos principios radica precisamente en lo que nos lleva más tiempo deducir: los mismos describen muy bien la manera en que funciona un bosque tropical húmedo. En otras palabras, todo lo que descubrimos en nuestra odisea de 12 años es algo que deberíamos haber adivinado desde el principio. Para que la agricultura del trópicol húmedo sea altamente productiva como sostenible, debe imitarse el bosque del trópico húmedo, que también ha sido altamente productivo.

Las posibilidades son enormes y un estudio de la parte norte de Honduras demuestra que el sistema de maíz/av/cc allí es 30% mas rentable que el sistema de maíz de altos niveles de insumos externos. Bien puede ser que simplemente comenzamos a desentrañar el potencial total de la agricultura de bajos insumos en las zonas tropicales húmedas.

Escrita por Roland Bunch. De <minifarms@gmail.com>

ORGANIC EXPERIMENT IN PUNE, INDIA

Posted by: "Suresh Motwani" motwanisuresh07@yahoo.com

Tue Nov 13, 2007

INDIA<http://www.theorgan ichome.co. uk/2007/11/ news.php? post=http: //www.theorganic home.co.uk/ 2007/11/organic- experiment- in-pune-india. php> November 12

Vilas Lokhande, an agriculture graduate and farmer in Jambroon village, 15 kms from Nanded city has devoted one acre of his land for growing soya bean only through traditional methods like using vermicompost for the soil or cowÃ¢â‚¬â„¢s urine for pesticides; i.e. organic methods. What is more important is that he has decided not to use chemicals on this plot. On the remaining three acres, he has sowed other oil seeds including soya bean and is tending the crops the way he has been doing all this time using urea and Diammonium Phosphate.

In this small village, an experiment is on. All 55 families including Lokhande Ã¢â‚¬â„¢s have agreed on paper to earmark a part of their land for organic farming see if it can be sustainable and reap them profits at the end of the harvest season. More than three months have passed since the sowing.

Ã¢â‚¬Å“ We will compare the cost benefits at the end of this year, Ã¢â‚¬ said Dadarao Patil, the sarpanch of Jambroon. On January 10 this year, the villagers held a special panchayat meeting

with the Pune-based Maharashtra Organic Farming Federation (MOFF) and resolved in writing that they would give organic farming a chance and allow the NGO to guide them in the process.

Ã¢â‚¬Å“ People believe that getting a good yield is impossible without chemical fertilisers and pesticides. We just want to show that it is possible for a farmer to make good money and get a good yield through organic techniques. We have told them that MOFF will not give them any money, only guidance on
organic techniques of farming, Ã¢â‚¬ said Harbans Singh, coordinator for MOFF in Nanded. Ã¢â‚¬Å“ This is a five year project to be completed in stages. In the end, we have promised to help convert Jambroon into a complete self sustaining bio village, Ã¢â‚¬ said Singh.

As promised, Ganpath Kondewad has devoted half his land to moong, urad and soya bean to be grown using organic techniques. Recollecting the days of his father when it all began, Kondewad said that chemical fertilisers and pesticides were introduced in the village in a big way a couple of years after the green revolution. Ã¢â‚¬Å“Around 1980, we would get bags of urea for free. In the initial year, the production increased drastically. After a couple of years, people started using DAP along with urea when the production fell a little. Much later, we started depending on the advice of the shopkeeper,Ã¢â‚¬ said Kondewad.

In these parts, jowar is grown widely; sugar cane and cotton are the chief cash crops. Other crops include moong, tur, jowar, urad, soyabean, mustard, cotton, channa and wheat. As a precursor to the project, MOFF did an economic baseline survey of the village with family details, agricultural details, available resources, livestock, irrigation facility, income source, agro-based

profession, family expenditure, agricultural expenditure, finances, investment, social status, amenities, health records, addictions,
observations on surroundings, problems with crop cultivation and expectations and future planning.

Ã¢â,¬Å“When they started using chemical fertilizers, there were a lot of micro organisms in the soil. Chemicals in the soil killed the organisms and the bio mass generated gave life to the crops. Now there are no live organisms left to die and chemical residue is only spoiling the soil further, not helping the crop,Ã¢â,¬ said Harbans Singh.

Since January, the farmers here have been meeting on a weekly basis with the MOFF and till June were learning techniques to practice vermicomposting, prepare the soil bed, and harness organic fertilizers and pesticides. Now discussions are on to harness the waste and the garbage to create biogas. Work is also on to improve the bio-diversity of the village. Saplings of a mixture of large, small and medium trees have been planted at planned distances.

Ã¢â,¬Å“ We want more insects, birds, and animals. We know that we have ruined our land and soil. We want to give this a shot,Ã¢â,¬ said Lokhande. Most of them have debts; at least 26 families live below the poverty line. A few do not have land. Ã¢â,¬Å“At the end of this project, we want the farmers to have more money in their pockets. Organic farming helps farmers in reducing the expenses drastically, Ã¢â,¬ Singh said.

By Express India

[GE_News] It's Official: organic really is better
GM WATCH daily list http://www.gmwatch.org

1.Official: organic really is better
2.Eat your words, all who scoff at organic food

EXTRACTS: ...[the new] research has shown up to 40% more beneficial compounds in [organic] vegetable crops and up to 90% more in [organic] milk. It has also found high levels of minerals such as iron and zinc in organic produce. ...the evidence of the nutritional differences has been mounting. Last summer a 10-year study by the University of California comparing organic tomatoes with those grown conventionally found double the level of flavonoids - a type of antioxidant thought to reduce the risk of heart disease. Other studies show milk having higher levels of omega3 fatty acids, thought to boost health.

1.Official: organic really is better
Jon Ungoed-Thomas
The Sunday Times, October 28 2007
http://www.timesonline.co.uk/tol/news/uk/health/article2753446.ece

THE biggest study into organic food has found that it is more nutritious than ordinary produce and may help to lengthen people's lives.

The evidence from the GBP12m four-year project will end years of debate and is likely to overturn

government advice that eating organic food is no more than a lifestyle choice. The study found that organic fruit and vegetables contained as much as 40% more antioxidants, which scientists believe can cut the risk of cancer and heart disease, Britain's biggest killers. They also had higher levels of beneficial minerals such as iron and zinc.

Professor Carlo Leifert, the co-ordinator of the European Union-funded project, said the differences were so marked that organic produce would help to increase the nutrient intake of people not eating the recommended five portions a day of fruit and vegetables. "If you have just 20% more antioxidants and you can't get your kids to do five a day, then you might just be okay with four a day," he said.

Researchers grew fruit and vegetables and reared cattle on adjacent organic and nonorganic sites on a 725-acre farm attached to Newcastle University, and at other sites in Europe. They found that levels of antioxidants in milk from organic herds were up to 90% higher than in milk from conventional herds.

As well as finding up to 40% more antioxidants in organic vegetables, they also found that organic tomatoes from Greece had significantly higher levels of antioxidants, including flavo-noids thought to reduce coronary heart disease. Leifert said the government was wrong about there being no difference between organic and conventional produce. "There is enough evidence now that the level of good things is higher in organics," he said.

2.Eat your words, all who scoff at organic food
Jon Ungoed-Thomas The Sunday Times, October 28 2007
http://www.timesonline.co.uk/tol/news/uk/health/article2753546.ece

ITS unassuming location belies its importance. Sandwiched between Hadrian's Wall and the busy A69 road to Newcastle upon Tyne is a 725-acre farm that will help to determine the nation's future eating habits. In a unique experiment, its rolling pastures and ploughed fields have been split into two so that conventional and organic produce can be grown side by side. It has enabled scientists to test the alternative foods rigorously and answer a question that most shoppers ask themselves on a regular basis: is buying organic better for you?

Findings from the GBP12m European Union-funded project, the biggest of its kind and the first to investigate systematically the physiology of produce from the different farming techniques, will be peer reviewed and published over the next 12 months.

But already one conclusion is clear: organically produced crops and dairy milk usually contain more "beneficial compounds" - such as vitamins and antioxidants believed to help to combat disease. "We have a general trend in the data that says there are more good things in organic food," said Professor Carlo Leifert, leader of the QualityLowInput-Food (QLIF) project. The research has shown up to 40% more beneficial compounds in vegetable crops and up to 90% more in milk. It has also found high levels of minerals such as iron and zinc in organic produce.

However, the evidence of the nutritional differences has been mounting. Last summer a 10-year study by the University of California comparing organic tomatoes with those grown conventionally found double the level of flavonoids - a type of antioxidant thought to reduce the risk of heart disease. Other studies show milk having higher levels of omega3 fatty acids, thought to boost health.

Over the past four years, the QLIF project, involving 33 academic centres across Europe and led by Newcastle University, has analysed the 725-acre farm's produce for compounds believed to boost health and combat disease.

Like other studies, the results show significant variations, with some conventional crops having larger quantities of some vitamins than organic crops. But researchers confirm that the overall trend is that organic fruit, vegetables and milk are more likely to have beneficial compounds. According to Leifert, the compounds which have been found in greater quantities in organic produce include vitamin C, trace elements such as iron, copper and zinc, and secondary metabolites which are thought to help to combat cancer and heart disease.

Patrick Holden, director of the Soil Association, said the research could help to contribute to a "seismic" change in the food industry: "If you know there are significant nutritional differences in these foods, any sensible citizen would conclude it must have health implications."

Passive Solar Greenhouses Store Sun's Heat in Barrels of Water

by Robert Thomas
University of Missouri
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Inexpensive passive solar greenhouses heated only by sunlight falling on 55-gallon barrels of water are effective for growing plants year-round, said a University of Missouri Extension specialist.

Heat from sunlight is stored in water-filled barrels during the day and radiates at night, replacing use of fossil fuel, said Eric Lawman, an agronomy research specialist at the Bradford Research and Extension Center (BREC) near Columbia.

"Passive solar greenhouses extend the growing season and allow plant production year-round," Lawman said.

Temperatures inside an experimental passive solar greenhouse at BREC did not fall below freezing during the past two winters, Lawman said, while daytime temperatures have reached into the 80s. There is a similar greenhouse at the MU Southwest Center in Mt. Vernon.

The greenhouses measure 24 feet long, 12 feet wide and 12 feet high. The 2-1-1 ratio is important for such greenhouses to be effective.

"It allows adequate surface area for sunlight and minimal inside area to lessen heat dissipation during dark hours," Lawman said.

To capture as much sunlight as possible, the greenhouse has an east-west orientation, with a sloped south-facing wall. Geographic latitude determines the ideal slope angle; for central Missouri, the south-wall glazing should be about 45 degrees. The sloped wall consists of two layers of clear plastic spaced 6 inches apart. A small inflator fan pushes air between the sheets, creating a zone of dead air that serves as additional insulation.

The other walls contain fiberglass insulation sandwiched between metal siding on the outside and particleboard on the inside. The white, waterproof particleboard reflects heat into the barrels.

To extend the growing season, the greenhouse needs 2.5 gallons of water per square foot of glazing, Lawman said. For all-season growing, the requirement is 5 gallons per square foot. Thermostat-controlled shutters and exhaust fans remove excess heat as needed.

The greenhouse at BREC cost about $3,000 to build. "If you can build a shed, you can build one of these greenhouses," Lawman said.

Throughout winter, growers can produce cold-season crops such as lettuce, carrots and strawberries. Some plants can be started from seedlings, he said. Construction details and photographs are online at http://aes.missouri.edu/bradford/education/solar-greenhouse/solar-greenhouse.php.

(Source: Eric Lawman, 573-884-7945)

NAFTA and Biotech: Twin Horsemen of the Ag Apocalypse
The Last Days of Mexican Corn
By JOHN ROSS, Mexico City

The single, spindly seven foot-tall cornstalk spiring up from the planter box outside a prominent downtown hotel here was filling out with new "elotes" (sweet corn) to the admiration of passer-bys, some of whom even paused to pat the swelling ears with affection. Down the centuries most of the population of this megalopolis migrated here from the countryside at one time or another over the course of the past 500 years and inside every "Chilango" (Mexico City resident) lurks an inner campesino.

But the solitary stalk, sewn by an urban coalition of farmers and ecologists under the banner of "No Hay Pais Sin Maiz" ("There Is No Country Without Corn") in planter boxes outside the downtown hotels, museums, government palaces and other historical monuments can just as easily be seen as a signifier for the fragile state of survival of Mexican corn.

As the year ripens into deep autumn, the corn harvest is pouring in all over Mexico. Out in Santa Cruz Tanaco in the Purepecha Indian Sierra of Michoacan state, the men mow their way down the rows much as their fathers and their fathers before did, snapping off the ears and tossing them into the "tshundi" basket on their backs.

In the evenings, the families will gather around the fire and shuck the "granos" from the cobs into buckets and carry them down to the store to trade for other necessities of life. It is the way in Tanaco in this season of plenitude just as it is in the tens of thousands of tiny farming communities all over Mexico where 29 per cent of the population still lives. But it is a way of life that is fading precipitously. Some say that these indeed may be the last days of Mexican corn.

In fact, this January 1 may prove to be a doomsday date for Mexican maiz when at the stroke of midnight, all tariffs on corn (and beans) will be abolished after more than a decade of incremental NAFTA-driven decreases. Although U.S. corn growers are already dumping 10 million tons of the heavily subsidized grain in Mexico each year, zero tariffs are expected to trigger a tsunami of corn imports, much of it genetically modified, that will drive millions of Mexican farmers off their land - in NAFTA's first 13 years, 6,000,000 have already abandoned their plots - and could well spell the end of the line for 59 distinct "razas" or races of native corn.

Corn was first domesticated eight millennia ago in the Mexican states of Puebla and Oaxaca and Mexico remains the fourth largest corn producer on the planet but its 22,000,000 ton annual yield pales in comparison to U.S. growers who are expected to harvest near 300,000,000 tons this year, accounting for 70 per cent of the world's maize supply. A third of U.S. corn acreage is now under genetically modified seed.

Big Biotec has had its guns trained on Mexican corn for a long time but under the national biosecurity law, Monsanto and its ilk have been barred from selling their GMO seed here. Now the transnationals are putting a full court press on the CIBOGEN, the inter-secretarial committee on bio-security, to vacate the prohibition on GMO sales - the measure was originally enacted in the late '90s in an effort to protect native seed from contamination and homogenization by genetically modified materials.

This September, the CIBOGEN was on track to designate experimental GMO farms in the north of Mexico (Sonora's Yaqui Valley and the Valley of Culiacan) where there are no native corns that could be corrupted by the engineered seeds but the designation was abruptly postponed around issues of potential contamination to the great frustration of a powerhouse pro-GMO coalition motored by the Biotec giants and including the Mexican National Farming Council (big growers), the National Association

of Self-Service Stores (Wal-mart - now the biggest tortilla retailer in the country), and the National Farmers Central (CNC) which groups together rank and file farmers attached to the once-ruling (71 years) PRI party.

A dubious milestone in the history of corn was reached in July when scientists at the National Genetics & Biodiversity Laboratories announced that they had successfully mapped the genome of Mexican maiz. That was the good news. The bad news is that the genome will be available to anyone who can pay the Institute's asking price.

Who owns the genome is crucial to the survival of Mexican corn. There is little doubt that the Monsanto Corporation of St. Louis Missouri would love to get its hands on this breakthrough information so that for-profit scientists could design seeds modeled upon the DNA of native corns for commercial sales. Mexican corn is a rich source of genetic history. Millions of adaptations to specific conditions have created a seed stock with extremely variegated properties. For millennia, native seed savers have set aside corn seed that is resistant to drought whose DNA structure Monsanto will now be able to simulate in its laboratories and market under its brand.

Monsanto took a giant step in locking up the genetic wealth of Mexico this past April 18 when it signed an agreement with the National Association of Corn Producers (CNPMM), a section of the CNC that groups together big corn farmers, to establish regional seed banks in the center and south of the country. CNC members were designated "guardians of the seed" and charged with assembling collections of native corn to be housed in Monsanto-financed repositories.

(Big bucks from Cargill and Maseca-ADM have also funded the seed banks.) "Allowing Monsanto to get so close to the secrets of Mexican corn is like asking Herod to baby-sit," writes Adelita San Vicente, an activist with the "No Hay Pais" coalition in a recent agrarian supplement of the left daily La Jornada.

55 per cent of the crops needed to feed the human race are now grown by just ten corporations. The biggest players in this monopoly game are Bayer, Dow, Dupont, Syngenta (once Novartis), and Monsanto. None of these conglomerates is a seed company. They all began their corporate life selling chemicals for war and farming.

Monsanto, which dominates 71 per cent of the GMO seed market, has operated in Mexico since the post-World War II so-called "green revolution" that featured hybrid seeds ("semillas mejoradas") that only worked when associated with pesticides and fertilizers manufactured by the transnational chemical companies. Selling hybrid seeds and chemical poisons in Mexico continues to be profitable for Monsanto whose total 2006 sales here topped 3,000,000,000 pesos ($300 million USD.) It doesn't hurt that Monsanto Mexico sells hybrid seed for $2 Americano for a packet of a thousand when its states-side price is $1.34.

22,000,000 Mexicans, 13,000,000 of them children, suffer some degree of malnutrition according to doctors at the National Nutrition Institute and Monsanto insists that it can feed them all if only the CIBOGEN will allow it to foist its GMO seed on unwitting corn farmers. But the way Monsanto sells its GMO seed is severely questioned.

Farmers are forced to sign contracts, agreeing to buy GMO seed at a company-fixed price. Monsanto's super-duper "Terminator" seed, named after California's action hero governor, goes sterile after one growing cycle and the campesinos are obligated to buy more. By getting hooked on Monsanto, Mexican farmers, once seed savers and repositories themselves of the knowledge of their inner workings, become consumers of seed, an arrangement that augurs poorly for the survival of Mexico's many native corns.

Moreover, as farmers from other climes who have resisted Monsanto and refused to buy into the GMO blitz, have learned only too traumatically, pollen blowing off contaminated fields will spread to

non-GMO crops. Even more egregiously, Monsanto will then send "inspectors" (often off-duty cops) to your farm and detect their patented strains in your fields and charge you with stealing the corporation's property. When Saskatchewan farmer Percy Schmeiser came to Mexico several years back to explain how Monsanto had taken his farm from him for precisely these reasons, local legislators laughed that it was a science fiction scenario. "It is going to happen to you," the old farmer warned with all the prescience of an Aztec seer. Mexican corn is, of course, not the only native crop that is being disappeared by global capitalism. Native seeds are under siege from pole to pole. In Iraq, where the Tigris and Euphrates rivers come together to form the birthplace of agriculture, one of the very first acts of George Bush's neo-colonial satrap L. Paul Brenner was to issue the notorious Order 81 criminalizing the possession of native seeds. The U.S. military spread out throughout the land distributing little packets of GMO seeds, the euphemistically dubbed Operation "Amber Waves." To make sure that Iraq would no longer have a native agriculture, the national seed bank, located at Abu Ghraib, was looted and set afire.

The threat to native seed has become so acute that the United Nations Food & Agricultural Organization is funding the construction of a doomsday vault on remote Svalbard Island in northern Norway 800 miles from the North Pole. It was thought that seeds cryogenically frozen and stored in deep underground bunkers would be insured of survival. But as the polar bears of that gelid bioregion now know only too well, nothing is safe from the globalizers' hunger to destroy the planet and what it grows.

John Ross is preparing to return to Mexico for the holidays equipped with a new - if uneasy - eye. Mil gracias to everyone who kicked in to help buy it. Contact: johnross@igc.org

You Are What You Grow

Brian Ulrich

By MICHAEL POLLAN
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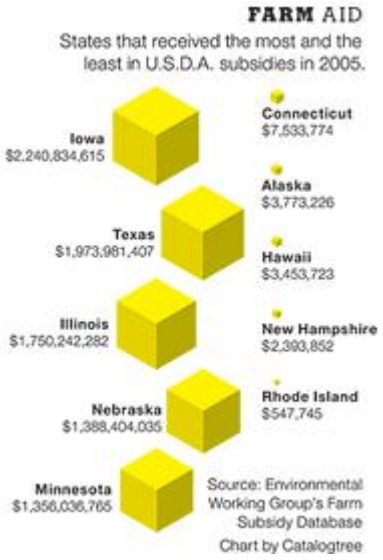
A few years ago, an obesity researcher at the University of Washington named Adam Drewnowski ventured into the supermarket to solve a mystery. He wanted to figure out why it is that the most reliable predictor of obesity in America today is a person's wealth. For most of history, after all, the poor have typically suffered from a shortage of calories, not a surfeit. So how is it that today the people with the least amount of money to spend on food are the ones most likely to be overweight?



Drewnowski gave himself a hypothetical dollar to spend, using it to purchase as many calories as he possibly could. He discovered that he could buy the most calories per dollar in the middle aisles of the supermarket, among the towering canyons of processed food and soft drink. (In the typical American supermarket, the fresh foods — dairy, meat, fish and produce — line the perimeter walls, while the imperishable packaged goods dominate the center.) Drewnowski found that a dollar could buy 1,200 calories of cookies or potato chips but only 250 calories of carrots. Looking for something to wash down those chips, he discovered that his dollar bought 875 calories of soda but only 170 calories of orange juice.

As a rule, processed foods are more "energy dense" than fresh foods: they contain less water and fiber but more added fat and sugar, which makes them both less filling and more fattening. These particular calories also happen to be the least healthful ones in the marketplace, which is why we call the foods that contain them "junk." Drewnowski concluded that the rules of the food game in America are organized in such a way that if you are eating on a budget, the most rational economic strategy is to eat badly — and get fat.

This perverse state of affairs is not, as you might think, the inevitable result of the free market. Compared with a bunch of carrots, a package of Twinkies, to take one iconic processed foodlike substance as an example, is a highly complicated, high-tech piece of manufacture, involving no fewer than 39 ingredients, many themselves elaborately manufactured, as well as the packaging and a hefty marketing budget. So how can the supermarket possibly sell a pair of these synthetic cream-filled pseudocakes for less than a bunch of roots?

For the answer, you need look no farther than the farm bill. This resolutely unglamorous and head-hurtingly complicated piece of legislation, which comes around roughly every five years and is about to do so again, sets the rules for the American food system — indeed, to a considerable extent, for the world's food system. Among other things, it determines which crops will be subsidized and which will not, and in the case of the carrot and the Twinkie, the farm bill as currently written offers a lot more support to the cake than to the root. Like most processed foods, the Twinkie is basically a clever arrangement of carbohydrates and fats teased out of corn, soybeans and wheat — three of the five commodity crops that the farm bill supports, to the tune of some $25 billion a year. (Rice and cotton are the others.) For the last several decades — indeed, for about as long as the American waistline has been ballooning — U.S. agricultural policy has been

designed in such a way as to promote the overproduction of these five commodities, especially corn and soy.

That's because the current farm bill helps commodity farmers by cutting them a check based on how many bushels they can grow, rather than, say, by supporting prices and limiting production, as farm bills once did. The result? A food system awash in added sugars (derived from corn) and added fats (derived mainly from soy), as well as dirt-cheap meat and milk (derived from both). By comparison, the farm bill does almost nothing to support farmers growing fresh produce. A result of these policy choices is on stark display in your supermarket, where the real price of fruits and vegetables between 1985 and 2000 increased by nearly 40 percent while the real price of soft drinks (a k a liquid corn) declined by 23 percent. The reason the least healthful calories in the supermarket are the cheapest is that those are the ones the farm bill encourages farmers to grow.

A public-health researcher from Mars might legitimately wonder why a nation faced with what its surgeon general has called "an epidemic" of obesity would at the same time be in the business of subsidizing the production of high-fructose corn syrup. But such is the

perversity of the farm bill: the nation's agricultural policies operate at cross-purposes with its public-health objectives. And the subsidies are only part of the problem. The farm bill helps determine what sort of food your children will have for lunch in school tomorrow. The school-lunch program began at a time when the public-health problem of America's children was undernourishment, so feeding surplus agricultural commodities to kids seemed like a win-win strategy. Today the problem is overnutrition, but a school lunch lady trying to prepare healthful fresh food is apt to get dinged by U.S.D.A. inspectors for failing to serve enough calories; if she dishes up a lunch that includes chicken nuggets and Tater Tots, however, the inspector smiles and the reimbursements flow. The farm bill essentially treats our children as a human Disposall for all the unhealthful calories that the farm bill has encouraged American farmers to overproduce.

To speak of the farm bill's influence on the American food system does not begin to describe its full impact — on the environment, on global poverty, even on immigration. By making it possible for American farmers to sell their crops abroad for considerably less than it costs to grow them, the farm bill helps determine the price of corn in Mexico and the price of cotton in Nigeria and therefore whether farmers in those places will survive or be forced off the land, to migrate to the cities — or to the United States. The flow of immigrants north from Mexico since Nafta is inextricably linked to the flow of American

corn in the opposite direction, a flood of subsidized grain that the Mexican government estimates has thrown two million Mexican farmers and other agricultural workers off the land since the mid-90s. (More recently, the ethanol boom has led to a spike in corn prices that has left that country reeling from soaring tortilla prices; linking its corn economy to ours has been an unalloyed disaster for Mexico's eaters as well as its farmers.) You can't fully comprehend the pressures driving immigration without comprehending what U.S. agricultural policy is doing to rural agriculture in Mexico.

And though we don't ordinarily think of the farm bill in these terms, few pieces of legislation have as profound an impact on the American landscape and environment. Americans may tell themselves they don't have a national land-use policy, that the market by and large decides what happens on private property in America, but that's not exactly true. The smorgasbord of incentives and disincentives built into the farm bill helps decide what happens on nearly half of the private land in America: whether it will be farmed or left wild, whether it will be managed to maximize productivity (and therefore doused with chemicals) or to promote environmental stewardship. The health of the American soil, the purity of its water, the biodiversity and the very look of its landscape owe in no small part to impenetrable titles, programs and formulae buried deep in the farm bill.

Given all this, you would think the farm-bill debate would engage the nation's political passions every five years, but that hasn't been the case. If the quintennial antidrama of the "farm bill debate" holds true to form this year, a handful of farm-state legislators will thrash out the mind-numbing details behind closed doors, with virtually nobody else, either in Congress or in the media, paying much attention. Why? Because most of us assume that, true to its name, the farm bill is about "farming," an increasingly quaint activity that involves no one we know and in which few of us think we have a stake. This leaves our own representatives free to ignore the farm bill, to treat it as a parochial piece of legislation affecting a handful of their Midwestern colleagues. Since we aren't paying attention, they pay no political price for trading, or even selling, their farm-bill votes. The fact that the bill is deeply encrusted with incomprehensible jargon and prehensile programs dating back to the 1930s makes it almost impossible for the average legislator to understand the bill should he or she try to, much less the average citizen. It's doubtful this is an accident.

But there are signs this year will be different. The public-health community has come to recognize it can't hope to address obesity and diabetes without addressing the farm bill. The environmental community recognizes that as long as we have a farm bill that promotes chemical and feedlot agriculture, clean water will remain a pipe dream. The

development community has woken up to the fact that global poverty can't be fought without confronting the ways the farm bill depresses world crop prices. They got a boost from a 2004 ruling by the World Trade Organization that U.S. cotton subsidies are illegal; most observers think that challenges to similar subsidies for corn, soy, wheat or rice would also prevail.

« Michael Pollan, a contributing writer, is the Knight professor of journalism at the University of California, Berkeley. His most recent book is "The Omnivore's Dilemma."