Ecosan-Based Tree Planting Guide: The WAND Foundation Experience

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Summary

This publication details our experience using humanure from the dry toilets into tree growing activities with small farmers as partners in the endeavor. The problems of biodiversity loss, poverty and deterioration of soils in the rural areas is a vicious cycle which if left unchecked would lead to a downward spiral of poverty and pauperism. Meanwhile tree planting activities suffer from lack of fertilizer thereby mortality of trees is high and growth stunted. Why not use human waste in tree growing activities? This publication demonstrates the various dry toilet systems we are using, waste collection and fertilizer production techniques, seedling nursery development, tree growing and field management activities. This is our contribution to the dearth in literature on the use of human waste in agriculture. Although this publication describes humanure-based fertilizer for medium-scale agro-reforestation initiative, the techniques can well be used in small tree planting schemes and household-level tree planting activities.

Introduction:

There is a dearth in clear, practical demonstration on how to use humanure in tree planting activities, thus this attempt. We see here and there nice diagrams of "closing the loop" and some photos of pots with growing plants, sometime comparing lush growth supposedly fertilized with humanure to one that is supposed to be "control" but that is all. We posit that this area is not well charted and thus we wish to contribute our practical experiences. In so doing we might be able to encourage others to go the direction of ecological sanitation, with the realization that there is money in human waste after all!

Our project site is mountain barrios of Sungay, Sinalac and Tagbalogo which is located in the mountain ranges in west of Misamis Oriental comprising the Caballero Mountain Range and the Mandangolan Mountain Range. These are catchment areas which drain water through rivers, streams and numerous creeks of the lowland areas in west Misamis Oriental. It provides water for domestic, agricultural and other uses to inhabitants living in the western portion of the province. The indigenous people known as Higaonon are believed to have occupied the mountain since time immemorial. The mountain areas suffer from the following problems, a. loss of flora and fauna due to burning and agriculture, b. shortage of potable water, c. uncertain cropping seasons due to changes in climate, d. denudation and accelerated soil erosion, and, e. flash-flooding resulting to siltation of rivers and coastal zones.

Our target is to reforest at least 300 hectares of upland areas within a 4-year period. Aside from tree growing, we integrate the growing of food crops such as taro, cassava, corn and vegetables. This is a good opportunity for us to demonstrate the use of humanure in agriculture in a bigger way and to determine the economics of ecosan toilet marketing and generating humanure as fertilizer source and replacement to the expensive and soil-depleting chemical fertilizer.

The goals of the project are the following;

1. To increase the supply of wood and other forest products (eg. bamboo) for local communities and for regional markets.

2. To hasten the reforestation and rehabilitation of open and denuded forest lands and the effective protection of plant and animal biodiversity in the area.
3. To conserve soil and water and enhance environmental condition in general.
4. To generate additional sources of income and livelihood especially for Higaonon communities dependent upon the forest resources.

The reforestation scheme falls in the ambit of what is called "social forestry." Social forestry means that local people are involved in the planning and decision-making in implementing reforestation with the assistance of technical experts. Even if most of the lands in mountain areas are public lands, local people have proprietary and tribal rights. Forestry projects in the past fail because this is not considered. Before the actual tree growing, we did a crop-site suitability assessment so that the trees planted are suited in a particular area. Some reforestation projects do not do site-suitability assessment resulting to high mortality of planted trees.

The following trees are suitable in the area; coconuts, coffee, cacao, mahogany, gmelina, durian, rambutan, giant bamboo and Philippine hardwoods such as narra and molave. Coconuts, coffee and cacao are crops with very high economic value while giant bamboo have the potential for controlling flash flooding in rivers and creeks at the same time very useful in the housing and furniture industry. Almost all houses in the mountains have bamboo as the basic building material. Mahogany and Philippine hardwoods are expensive woods for the furniture industry with Philippine furniture one of top export product of the country.

This project run for 4 years with the first year (2011) devoted to community organizing, site suitability assessment, spring development and the installation of seedling nurseries and an initial tree planting of 100 hectares. The second year as well as the third year will be devoted to full tree planting activities to cover the remaining 200 hectares while the fourth year and onwards beyond the project life will be consolidation and site maintenance activities.

Starting on the 6th year of the project and beyond this project, it is expected that fruit trees and coconuts will be fruit-bearing already and marketing of products will start. By this time, a forest-based agri company co-owned and operated by the WAND Foundation and the Higaonon organization will be formed. On the 10th year of the project, it is envisioned that selective harvesting of timber trees and then processing and marketing will already be done.

A. The Ecosan Toilets as Fertilizer Factory

Our dry toilets are our fertilizer factory. Shown here is our basic single-vault model. Single-vault because it consist of a single room measuring about 1m x 1m with a drum cut in half as fecal matter collector. The drum is lined with black garbage bag and the waste collected regularly. This photo shown here are two single-vault toilets we installed during Typhoon Washi. The power of this toilet system is that it is portable, transferable, easy to construct and easy to use. The only highly technical design element is the specialized toilet bowl. The cost of the bowl is about 4 USD while the cost of one entire toilet range from 3-4,500 pesos (USD 69-104) depending on the local materials used. During Typhoon Washi, we used recycled sheets further reducing cost. For more details of our dry sanitation solution, please see, http://www.ecosanres.org/pdf_files/SayreEVWithOurOwnHandsSept2010.pdf

Photo 2. Single-vault ecosan toilet in a typhoon-devastated area.

Photo 3. Ecosan toilet made of recycled materials.

Shown here is another single-vault ecosan toilet shared by 3 families located in an easiy-flooded zone. The pour-flush toilet is not applicable in this area because the septic tank becomes full

during flooding. There are so many places in the Philippines with similar situation like this one. For more details on our sanitation solution in flooded zones, please see, http://www.susana.org/docs_ccbk/susana_download/2-1149-flooded-zones-ecosan-solutionrevised.pdf.

Photo 4. Single-vault ecosan toilet in a flooded zone.

The beauty of the single-vault is that it is portable and entire units can be transferred where it is needed. A local manufacturer can build toilets in his workshop and then market it to interested buyers. One elf truck can transport 8 ecosan toilet units.

Photo 5. Ecosan toilets loaded in an elf truck.

An improvement of the single-vault is an entirely portable, interchangeable, single-vault dry toilet, 1.2m x 1.2m floor space that uses steel framing with a price of about 180 USD to cater to the middle-class and applicable in most biophysical and climatic regimes with the following improved design elements; **a.** appropriate for both "washers" and "wipers." Some designs is designed only for "wipers" and do not have anal and hand washing facility, **b.** rather than manually scoping the feces cover and placing it on the feces, a dispensing mechanism located at the back pushes down the mix, so the user *does not look down and see* his feces after use, **c.** instead of drum to store fecal matter which fills quickly, a box lined with plastic or plain galvanized iron sheet is used. In this way, waste management is cheaper, efficient and the box replaced every 3 months or so with daily labor consisting of cleaning/wiping the toilet floor. The steel frame is screwed and bolted and can be easily taken apart to its component parts and assembled again. This ecosan toilet is designed for parks, commercial farms where workers are mobile and toilet facility scarce. This is also appropriate in emergencies since the toilet can be packed in compact wooden boxes and assembled on site.

Photo 6. Steel-frame for a single-vault ecosan toilet.

Photo 7. Inside the stee-framed single-vault ecosan toilet.

For highly-dense places such as slums and river settlement, we designed a simple "attached single-vault" toilet. The toilet is also applicable in most poor households, especially those with nursing mothers who do not want to go out at night to use the toilet (in the case of toilets detached to the house). The posts can be raised to one's specifications and the structure conforms to the configuration of the dwelling.

Photo 8. Ecosan toilet attached to the house.

In hilly areas where wind can easily destroy the single-vault and where the water table is low, our choice is the "arborloo". After each use, soil is poured. The flooring and toilet bowl including the superstructure is transferred once the pit is full and the pit planted to crops.

Photo 9. Single-vault ecosan toilet in a mountain area. This is not suited in hillsides where strong wind can easily topple the structure.

Photo 10. Preparing the pit for the arborloo toilet.

The size of the pit depends upon the choice of the family. Some prefer smaller size in order to get the humanure in a short time. Others want the pit to be deep so that they don't need to empty it for a longer period of time.

Photo 11. If soil is loose, the pit is lined with bamboo matting to support the sides.

Instead of a ring-beam to hold the cover-slab in place, we widen the side of the wall and leave about 4 inches each side to hold the cover-slab. We found this effective. Iron rebars are used to strengthen the flooring. The bamboo matting is used to hold the cement mix. The hole shown below is where the arborloo toilet bowl is fitted.

Photo 12. Concrete cover-slab.

Photo 13. Inside the arborloo. Spartan and functional. Total cost is 45 USD.

Photo 14. This is how the toilet bowl looks like when viewed at the top. We made the bowl ourselves. Each bowl cost 4 USD.

Photo 15. The superstructure is made entirely of wood poles coming from the vicinity.

Photo 16 . The complete toilet. Elegant, robust, cheap, functional and socio-culturally appropriate.

In our previous installations, we dug a second pit near the pit where the cover-slab and superstructure is built, the second pit ready for the cover-slab to be transferred once the first pit is filled. This time we did not do it because of incidence of accident with people and animals falling in the second pit. Our strategy now is a. to build a second pit at a later time and transfer

the structure when the first pit is full, or, b. to dig a smaller deeper pit and get the humanure out via this pit, old one first, rendering the pit half-empty and usable again.

B. Waste Collection and Storage

In the collection of humanure from the ecosan toilets, the collector should use gloves and masks in order to minimize contamination with pathogens from the feces. The load in the single-vault ecosan toilets are doubly placed inside black garbage bags and sacks. The garbage bags prevent whatever fluids emanate from the load while the sacks prevent the load from spilling-out.

Photo 17. Collection of waste from ecosan toilets.

For household level use of humanure, simple shed for waste storage can be done if the ecosan toilet is a single-vault. However for the arborloo type, storage is in the pit itself and the humanure is taken out when the pit is full. Open ground can be used also as temporary storage provided that the waste is taken right away to prevent animals from scattering it.

Photo 18. Temporary storage.

The waste goes to a final storage box made of cement. We recommend double or triple compartments so that when the second compartment is full, waste from the first compartment is then taken out and mixed with organic waste in the farm, biochar, lactic acid bacteria and indigenous microorganisms. Cost of a box like this is 70 USD.

Photo 19. Cement storage boxes.

Photo 20. Another waste storage box.

C. SaniFert Production

SaniFert is our brand-name for humanure-based fertilizer. Humanure plus other organic waste in the farm is mixed in a chamber. After mixing this thoroughly, it is covered with heavy plastic and left to "cure" for about 2 months before it is used. Curing also means watering and turning the mix every 2 weeks.

Photo 21. Fertilizer production. Mix of fecal matter, urine, biochar, lactic acid bacteria, organic farm waste and indigenous micro-organisms.

Photo 22. Urine is added to the mix. The organic matter and biochar in the mix "binds" the nitrogen from the urine.

Photo 23. Curing boxes. In about two months, these are ready for harvest.

We are doing rapid composting. Rapid composting involves inoculating the pile with a cellulose decomposer fungus called Trichoderma harziamum which is available in the Department of Agriculture at 10 cents per plastic bag and one plastic bag can be used to decompose ¼ ton of biomass.

Photo 24 . Another view of fertilizer mix being cured.

Urine stored in plastic containers is simply stored ready for use. Some recommend storing urine for at least one month but in our case, we use urine when it is available. Either urine is mixed in the SaniFert or used directly to the plants.

Photo 25. Urine are stored in 18-liter containers.

Human waste with biochar, lactic acid bacteria and effective micro-organisms is mixed with other farm wastes to become high-grade organic fertilizer we call SaniFert which is short for "sanitation fertilizer". Our idea is not to have feces alone as fertilizer which turn-off some users but add this to all other organic wastes in and around the household/farm. The organic waste that already incorporated other farm wastes is pulverized and mixed in a gasoline-powered mixer. When this mixer is not available, the use of spade and spading fork will do the job.

Photo 26. Mixing the various components.

Demonstrating the use of ash or a mix of sawdust, if no sawdust is available, then woodchips to replace ash as the feces cover, since ash is limited in some areas. Biochar, lactic acid bacteria and effective micro-organisms are added to degrade the mix quickly (lactic acid), suppress odor (biochar) and improve the organic fertilizer (effective microorganisms) mixture.

Photo 27. Demonstration how to mix the various components.

Biochar, this one, from coconut shell is a necessary ingredient in the fertilizer mixture.

Photo 28. Biochar.

This is the resulting fertilizer ready for small-scale gardening and tree planting activities.

Photo 29. Ready to use fertilizer.

Humanure-based fertilizer is transported to the field ready for use. The fertilizer is first applied basal at about 1 kilo per tree then applied ½ kilo every 3 months when there is rain as side dressing.

Photo 30. Ecosan-based fertilizer.

May we emphasize that the lactic acid, biochar formulation is not needed for household level waste-to-fertilizer formulation. The waste from the ecosan can be used immediately in tree planting activities even without storage time to kill pathogens. One has to do is to use protective measures such as masks and gloves in handling the waste.

Another note is with regards vermi-composting or the use of earthworms which we do not recommend unless you really have a nerve for challenges. One need to look for sources of earthworms (African night crawlers) which is not easy, maintain proper moisture which is at least 80% and one need to regularly feed the earthworms with fresh organic matter otherwise they die or migrate. Then when one uses ash as feces cover, the alkaline nature of ash will kill the earthworms.

D. Seedling Production

Tree growing activities would not be successful without a seedling nursery. Other planters opt for wildlings or seedlings gathered from the field but the quality and robustness of wildlings is difficult to ensure. With a seedling nursery we are sure that the seeds come from robust, healthy mother trees. A seedling nursery need not be expensive and local materials such as bamboo, wood poles and coconut fronds can be used.

Photo 31. Seedling nursery made of local materials.

The collected seeds are sown in sowing beds and sprouting seedlings are then placed in plastic bags. The sowing beds should have a 50:50 mix of garden soil and humanure in order to ensure healthy growth of the seedlings. Some seedlings needs to be scarified (eg. mango) or soaked in water overnight (eg. narra) in order to hasten seed germination.

Photo 32. Germinating the seeds.

Photo 33. Use of humanure in seed germination.

Photo 34. Transferring the germinated seeds to polybags.

Care must be taken to water the newly transplanted seedlings everyday. Overwatering should not be done or else the seedlings will die (damping off).

Photo 35. Watering the newly transplanted seedlings.

Photo 36. Covering the newly transplanted seedlings.

Before the seedlings are transplanted in the field, these are first hardened by exposing it to sunlight and the elements akin to the situation in the field. In this way mortality is minimized.

Photo 37. Hardening the seedlings.

Photo 38. Mahogany seedlings being hardened.

E. Tree Planting Techniques

Seedlings are carried to the field by large baskets. Care must be taken not to disturb the soil where the roots are anchored. The seedlings should not be piled inside the baskets in order to prevent breaking of the stem.

Photo 39. Loading seedlings in rattan baskets.

Photo 40. Bamboo seedlings.

Holes are dug where the seedling is to be planted. For hole size we recommend ½ m x ½ m. distance between holes depend on the type of plants. Coconuts for example need a distance of 10m x 10m while guyabano only 6m x 6m. timber trees can be planted 2m x 2m then culling done after 2 years for a final distance of 4m x 4m.

Photo 41. Hole digging.

Humanure-based fertilizer are placed inside the hole. We recommend at least 1 kilo per hole as basal fertilization. Gloves must be used when handling this fertilizer.

Photo 42. SaniFert.

Photo 43. Placement of organic fertilizer as basal application.

Side-dress fertilizer application for growing plants can be done every 3 months. This will be timed during the rainy season. The fertilizer is placed around the base of the plant and then covered with top soil.

Photo 44. Growing bamboo seedlings.

To prevent weed competition, ring weeding should be done once every 3 months or depending on ocular inspection, eg. when weeds are profuse already even before the 3rd month.

Photo 45. Ring-weeding.

During dry days extending up to 3 weeks or more, the seedlings should be watered. Our method is to use bamboo with punched pin holes at the bottom. This is very effective and ensures wet micro-climate at the base of the plant.

Photo 46. Watering the plant using bamboo tube.

Urine is used “ad libitum” and watered to the growing plants. It is also used as basal fertilizer together with the solid humanure-based fertilizer. Urine is very effective in promoting healthy growth of young plants perhaps because of its high nitrogen content. Urine directly coming from the ecosan toilets are used without waiting for storage time.

Photo 47. Urine application.

Young seedlings are mulched with coconut husk in order to prevent urine fertilizer and water from dissipating to the atmosphere during dry days. Other organic materials such as corn stalks, grasses, etc can be used also as mulch.

Photo 48. Mulching with coconut husk.

Below is how we envision a tree farm system. It should be one where trees and food crops grow in harmony and in complementary manner. The opposition to planting trees by small farmers is that it competes with food production but this should not be so. A choice/mix of root crops such as cassava and yams and vegetables can grow well with tree crops. Also, there are trees that are vegetable crops by itself (eg. Moringa olefiera, Gnetum gnetum) and these type of crops can substantially improve food security by small farmers while at the same time improving the soil and farm condition of the landscape.

Photo 49. Young plantation.

Demonstrated Impact:

The goal of our initiative is to improve the overall quality of life of disadvantaged households by providing solution to poor sanitation, spread of diseases and water scarcity by the implementation of low-cost urine diverting dehydration toilets and rainwater/grey water conservation and using human waste as fertilizer for the plants. The centerpiece is the implementation of appropriate and alternative to water-based toilet system for water deficient poor communities. The toilet system is urine diverting and dehydration with collected human waste recycled as fertilizer for the plants. Human waste contains high values of nitrogen and phosphorus. The envisioned effect on the long term include; a) prevention of open defecation for poor families thereby reducing infestation of intestinal parasites and water/feces- borne disease; b) grey-water and rainwater harvesting using recycled drums means less labor for women and children in fetching water; c) vegetable gardening which is a central component means improvement in nutrition and improving the vitality of poor families; d) tree planting means improvement of the integrity of the upland and watershed areas; e) sale of tree products eg.

fruits, timber, latex, copra, nuts, vines, etc. means increase in income; f) creation of functional clusters means active participation of local residents in the life of the community.

Our successes encompasses two provinces already mainly in Mindanao where poverty and social exclusion is prevalent. Our closed loop system does not only end in promoting ecological sanitation and the re-use of human waste in order to improve nutrition and health but also integrates the aspect of land redemption which redeem productive agricultural land under local mortgage called "prenda." Prenda effectively disenfranchise the near-landless farmer and our scheme return the land to him under a co-management scheme, provide productive inputs on a micro-financing system and promote social mobilization and entrepreneurial activities aimed at full emancipation of the farmer and improving his and his family's overall quality of life. Integral to the initiative is the promotion of water and sanitation as one of core support and integrating agro-reforestation and development. Water and sanitation is a human right issue with the UN explicitly recognizing that clean, drinking water and sanitation as essential to the realization of ALL human rights (Resolution 64/292). In its General Comment No. 15, it mentioned that "human right to water is indispensable for leading a life in human dignity". Water should be sufficient, safe, acceptable, physically accessible and affordable.

Social Return on Investment (SROI):

The firm Impact Investment Shujog, Ltd. (http://www.shujog.org) conducted an impact analysis on the activities of the WAND Foundation on June 2012 based on data from previous initiatives and calculated a total monetized social impact of USD 841,519 from a total input of USD 142,942 or a SROI of 5.89. According to them, the social returns include the following;

- Increased income as a result of increased farm productivity due to fertilizer created by ecosan toilets;
- Increased income as a result of micro-finance and land redeem services for investment in agriculture and microenterprise;
- Reduced spending on fertilizer;
- Reduced medical cost as a result of improved health and sanitation.

Increased disposable income due to reduced spending on fertilizer and foodstuffs as a result of WAND's fertilizer program represents one of the largest social impact. Fertilizer created by WAND's ecosan toilets permit households to spend less on agricultural inputs and also makes the household more self-sufficient in terms of growing their own vegetables thereby reducing spending on food.

Potential for Scaling-up:

The upland areas in Mindanao as well as in most parts of the country and even in SE Asia are already eroded and constant farming with corn or cassava makes the land poor and erosion prone. Trees are sparse due to constant cutting for household use and for the small timber market in the town. Water is very scarce especially during long dry spell and local inhabitants get water

in drying rivers and streams often walking long distances. Women and children are the ones who usually fetch water. Most people living in the uplands come from the Indigenous communities and their education is usually very low. Open defecation is practiced by most residents causing the spread of diseases and intestinal parasites. The ordinary plush-pour toilet is no longer useful since there is no water to flush the excrement. Poverty is very high and with it malnutrition and general feeling of unwell. Average income per month is pesos 1,200 (28 USD). Social service from the government is almost non-existent and health care is done mostly by local medicine men, using crude instruments and herbal cures. Given that the socio-economic and biophysical conditions of the provinces we are working with are very similar with that of most of SE Asia, the potential for scaling-up of my approach is vast.

Collaborative Partnerships:

Our initiative could have not taken-off the ground without the following partners:

1. The German Doctors for Developing Countries and the German Federal Ministry of Economic Cooperation and Development for introducing us to ecological sanitation and providing much needed funding to test a few models and replicate these in other sites.
2. The Innovations of the Base of the Pyramid – Asia for pilot-testing different dry toilet designs and explore market possibilities.
3. The Bill and Melinda Gates Foundation for providing funds to conduct research on the safe, agronomic use of human excreta.
4. The German Embassy in Manila for providing funds to establish the Mindanao Ecosan Center.
5. The Swiss Embassy and Australian Embassy in Manila for providing funds for us to provide sanitation during the Typhoon Washi Emergency in Cagayan de Oro and Iligan City.
6. The Municipal Local Government Units, Department of Environment, Department of Agriculture and Department of Education for providing technical assistance in training and capacity building activities.
7. New Zealand Aid for providing support in integrating tree-growing, ecological sanitation, small-scale agriculture and water system development.

Conclusion and way forward:

The variety and health of our tree resources is an important element in the survival of our planet. Trees and forests are living entities and home of so many organisms. It protects our farms and water resources and is important for our leisure activities. Trees store carbon and prevent what is called as "greenhouse effect". Trees contribute much to our economy. The benefits that we can derive from our tree resources are multiple and includes the following; economic, soil erosion control, habitat for animals, for our leisure, among others. Our main goal is to use our tree resources in a sustainable manner not only for us but also for our children at the same time preventing open defecation and ensuring healthy local population.

The way forward we envision for our initiative is to franchise management of human waste via ecosan toilets and recycling of the generated waste and marketing it as high-grade organic

fertilizer. Via the franchise, we intend to create "ecosan marketing hubs" in a few additional provinces in the country.

Useful websites:

Sustainable Sanitation Alliance (SuSanA): www.susana.org
Center for Advanced Philippines Studies (CAPS); www.caps.ph
Solid waste Management Association of the Philippines (SWAPP); www.swapp.org.ph
EcoSanRes Program of Stockholm Environment Institute (SEI): www.ecosanres.org
Ecosan Program of German Technical Cooperation (GTZ): www.gtz.de/ecosan
Philippine Ecosan Network (PEN): www.ecosan.ph

Links:

http://www.kagay-an.com/indigenous-adaptation-an-ecological-sanitation-success-in-sendong-aftermath/

http://issuu.com/businessweekmindanao/docs/bwm_april_20_?mode=embed&layout=http%3A%2F%2Fskin.issuu.com%2Fv%2Flight%2Flayout.xml&showFlipBtn=true%22+target%3D%22_blank%22

http://www.susana.org/lang-en/news/latest-news/728-partner-news-wand-foundation-sanitation-emergeny-response-succuessful

http://www.americanchronicle.com/articles/view/275171

http://www.americanchronicle.com/articles/view/238366

http://thetechawards.thetech.org/the-laureates/stories/1645

http://www.youtube.com/watch?v=702V1eHeMgA&feature=related

http://www.youtube.com/watch?v=ZZMvFVoBHxM&feature=player_embedded#!

http://www.bworldonline.com/weekender/content.php?id=32034

http://propinoy.net/2011/10/31/new-beacons-of-hope-9th-ten-accomplished-youth-organizations/

http://www.dfa.gov.ph/main/index.php/news-from-rp-embassies/3877-filipino-youth-leader-recognized-for-economic-empowerment-project

http://www.mb.com.ph/articles/349848/giving-back-to-mother-earth

http://susanawg8.wordpress.com/2012/01/02/urine-diversion-dehydration-toilets-after-typhoon-sendong-in-the-philippines/

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http://www.justthetipofaniceberg.com/2012/01/to-help-solve-sanitation-problems-in.html

http://www.ecosanres.org/pdf_files/SayreEVWithOurOwnHandsSept2010.pdf

http://mb.com.ph/articles/346489/ph-foundation-bags-israel-award

http://pinoyoverseas.net/news/uncategorized/phl-climate-change-project-wins-intl-award/

http://www.tempo.com.ph/2012/philippine-project-wins-ranan-weitz-2011-international-competition-in-israel/#.TxPhZ2-0y8A

http://www.gmanetwork.com/news/story/243091/pinoyabroad/phl-climate-change-project-wins-intl-award

http://dfa.gov.ph/main/index.php/news-from-rp-embassies/4473-phl-bags-2011-raanan-weitz-international-competition-on-integrated-development-projects

About the Authors:

Elmer V. Sayre

Elmer V. Sayre was born in 1959 in a sleepy, farming village of Turno, in Dipolog City, in a family of nine, of near-landless parents eking an existence as toddy gatherer and housewifery. In childhood he strived to better his lot through study, hard work and discipline with the goal that in so doing he will in return help the poor and unshod, the lineage where he came from. He was able to study in some of the premier schools by winning scholarships, most notable is a Ph.D. fellowship given by the International Development Research Centre (IDRC) in Canada. His fields are Agricultural Economics (Xavier University, 1980), Extension Administration (Silliman University, 1985) and Community Development minor in Social Forestry (University of the Philippines at Los Banos, 1991). After a teaching stint at Xavier University and Silliman University where he taught subjects in agricultural economics, project planning and rural extension, he decided to work in grassroots areas in Mindanao, where talent and expertise is very much wanting and where poverty, social exclusion and helplessness stare daily in the face. He focused his attention to promote activities related to water system development, biodiversity and agro-forestry, ecological sanitation and rural organizing with emphasis on the poorest of the poor. To date his work spans three provinces with more than 3,000 farming families being assisted. His initiatives won a number of recognition already (Israel, United States, Philippines). In 2007 he won an Australian Leadership Award enabling him to do research and study at the Crawford School of Economics and Government, Australian National University in Canberra. To sharpen his scholarship he wrote about his experiences and spoke to a number of international conferences in Turkey, Vietnam, Germany, Australia and Malaysia. He is married to Cora Zayas, also a social development worker like him and has 2 children. In July-August 2010 he was a scholar-in- residence at the Rockefeller Center in Bellagio, Italy. In 2011 he was selected as one of "public intellectuals" by the Japan Foundation and interacted with fellow intellectuals in

Tokyo. His hobbies include writing poetry and short stories aside from his passion for farming and small-scale agro-forestry. He managed a 10-hectare agro-forest farm in Libertad, Misamis Oriental where the WAND eco-village featuring ecological sanitation is located. He is a published poet and a short story writer.

Jed Christian Zayas Sayre

Jed Christian Zayas Sayre at 23 years old is a Municipal Councilor of Libertad Municipality in Misamis Oriental where the Association of Locally-Empowered Youth in Northern Mindanao (ALEY-NM), active in promoting ecological sanitation is based. Jed is a Fellow of the Philippines 21 Young Leaders Initiative of the Asia Society. This is a cross-national engagement of new generation of leaders in the Asia-Pacific region and the US, from across the fields of business, politics, civil-society, media, arts and culture, and academia. He is also an Asia-Pacific Future 100 Fellow for Most Inspiring Entrepreneurs and Social Change-makers. His work in ecological sanitation is funded by the Japan Fund for Water and Idea Wild. He is also the Executive Director of the Tuburan Para Libertad Foundation, Inc. TPLFI provides micro-financing support to local livelihood ventures implemented by the youth and poor artisans as well as he is the Proprietor of Jed's Kofi. Jed's Kofi is locally-made coffee from corn, coffee, moringa and lemon-grass.

The WAND Foundation:

The **Water, Agroforestry, Nutrition and Development Foundation** promotes and implements social development initiatives focused on the improvement of the environment and the agriculture sector, rural entrepreneurship and ecological sanitation. The initiatives of the WAND Foundation is a winner of the 2004 World-Bank organized Panibagong Paraan (Development Marketplace), a finalist of the 2005 International Development Marketplace held in the USA and 2011 winner of an international competition held in Israel. We received a national human rights award in 2009 for our work in land redemption and land co-management with small farmers and is a grantee in 2009 by the Innovations for the Base of the Pyramid in Asia (iBoP-Asia) for our work on dry toilet design using local materials. Our work is published in the sustainable sanitation alliance (www.susana.org) as well as in several newsletters and internet sites. We have also published a book on ecological sanitation entitled "With our own hands: experiences in promoting ecological sanitation in Mindanao" which was a product of a fellowship at the Rockefeller Center in Bellagio, Italy. In 2011 we got a grant from the Bill and Melinda Gates Challenge Round 6 on new technologies for health and sanitation.