

**Implementing sustainability practices and technology in
the Sierra Norte of Puebla: Improving the economic
and social status of indigenous women**

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Introduction

The indigenous people in Mexico maintain alive many of the traditions, art, food, and habits from their pre-Hispanic ancestors, preserving in large the indigenous identity. Throughout the country the indigenous are dispersed in different size groups.¹ In addition to their native language, the handicrafts differentiate as well as represent the correlation with others indigenous groups.² In these communities, the artistic needlework is executed by the women, who stamp the uniqueness of each particular group through their handicrafts labor. The population selected within the indigenous community for this project will be the women, who are the driving force in the family.³ After all, they are in charge of the child care, handicrafts work, and helping with field tasks.

In Mexico there are approximately twelve millions indigenous people disseminated in 20,000 different localities.⁴ Within this indigenous population there are 62 different groups with their own language and culture.⁵ Furthermore, data from CDI shows that Nahuatl is spoken by 67.5% of the indigenous individuals. Many Nahuatls call themselves in Nahuatl *macehual* or *campesino*, the Nahuatl term means someone that speaks with authority and knowledge.⁶

¹ Consejo Nacional de Fomento Educativo, (Nacional Education Council) (CONAFE) http://sftp.conafe.edu.mx/mportal7/modules.php?name=Content_local&pa=showpage&pid=1&icveProg=1&config=Pue (accessed September 29, 2006).

² Lourdes Baez, "Nahuas de la Sierra Norte de Puebla" *Comision Nacional de Desarrollo de los Pueblos Indígenas*, 2004 http://cdi.gob.mx/monografias/contemporaneos/nahuas_sierra_norte_puebla.pdf (accessed September 13, 2006).

³ Bertha Dimas-Huacruz, "Márhijua Jánhaskati. Ciencia, mujer y universidad indígena." *Observatorio Ciudadano de la Educación*. Colaboraciones Libres. Volumen V, número 192. México, 2005 <http://www.observatorio.org/colaboraciones/huacruz.html> (accessed January 31, 2007).

⁴ "Los Pueblos indígenas de Mexico" *Comision Nacional de Desarrollo de los Pueblos Indigenas* [CDI] n.d http://www.cdi.gob.mx/index.php?id_seccion=3 (accessed September 13, 2006).

⁵ Robert Ondean-Gamboa, "Servicios bibliotecarios para los pueblos indígenas". http://cdi.gob.mx/index.php?id_seccion=530 (accessed August 5, 2006)

⁶ Cristina Saldaña. "Pueblos indigenas de Mexico: Nahuas de la Sierra Norte de Puebla/Macehual" <http://cdi.gob.mx/ini/monografias/nahuaspue.html> (accessed September 19, 2006)

Marginalization and poverty afflict these indigenous communities. The Draft Programme of Action for the Second International Decade of the World's Indigenous people prepared by the United Nations indicates that "indigenous peoples in many countries continue to be among the poorest and the most marginalized".⁷

1. Purpose of this study

The purpose of this project is to conduct training workshops in Atla, an economically depressed area in the Sierra Norte of Puebla, Mexico. (See Appendix A). This study is focused on empowering the indigenous women while enhancing current handicrafts skills in an effort to contribute to the sustainable development of the community.

The considerable consumer appreciation for handicrafts opens opportunities to this village to market their merchandise. Learning marketing techniques and cooperative models will allow these indigenous women to increase their profits. As a consequence of this educational experience, they will gain more skills to pass on to their daughters.

2. Objectives

This applied project pursues five objectives:

1. Leading handicrafts workshop with indigenous women to challenge their creativity and open a wide set of opportunities to diversify and improve the quality of their product.

⁷ "Draft Programme of Action for the Second International Decade of the World's Indigenous People". United Nations (UN). Report from Secretary-General. 2005:5
http://www.unm.edu/~nasinfo/symposiumindigenous/files/UN_2nd_Decade_of_Indigneous_Peoples.doc
(accessed February 3, 2007)

2. Promoting entrepreneurship skills through marketing and pricing educational workshops.
3. Creating a value added to their product to improve marketability and receive profits, and to publicize where the merchandise was produced.
4. Teaching the properties and value of the local products to prepare the indigenous women to compete in the local and global markets.
5. Building an improved stove prototype to facilitate indigenous women to change cooking practices and receive related health benefits.

This project's motivation to strengthen indigenous women handicrafts skills with an entrepreneurship orientation and sustainable practices corroborates with the proposed action plan of the United Nations for indigenous communities. At the sixtieth session regarding indigenous issues, the United Nations has recommended that "culture be integrated as a prerequisite and a basis for development project design in order to build "development with identity", respecting people's way of life and building sustainable human development." ⁸

3. Factors affecting development

Inaccessibility makes the indigenous villages in Mexico receive scattered and rather deficient attention by the local government. In many instances, politics interfere with the funding destined to accomplish improvements in the communities. Indigenous communities have remained in a developmental stagnancy for many years. In particular in the last 30 years the migration of indigenous people has increased from the rural areas

⁸ Ibid., 9

to the cities.⁹ Specifically, Vazquez & Hernandez mention that the factors affecting migration are due to low productivity, a drop in the price of agriculture-related products the lack of land ownership, a deficiency of basic services, and low demand for local handicrafts.¹⁰

The following are some of the physical limitations and missing elements affecting their progress:

- 1) The physical isolation of many indigenous groups that live in the Sierra Madre Oriental (a mountain range in northeastern Mexico). The topography of the mountains in the Sierra presents a rather difficult access.
- 2) The lack of sewing resources to help the women handicrafts projects and marketing resources to develop sustainable practices to become more auto-sufficient.
- 3) The accessibility to materials to manufacture the indigenous women's handicrafts.

Provision of sanitary infrastructure is missing in the communities and in their dwelling

3.1. The Sierra Norte economic and social factors overview

The Sierra Norte of Puebla is a rural area in which the main source of income is agrarian products. Environmental depletion is an ongoing issue with indiscriminate natural resources exploitation. Based on the 1995 data obtained from National Institute of Statistics, Geography and Information (INEGI), the Sierra Norte of Puebla had 35

⁹ Vazquez-Flores and Hernandez-Casillas. *Migración, resistencia y recreación cultural: El trabajo invisible de la mujer indígena*. (Intituto Nacional de Antropología. Mexico. D. F. 2004).

¹⁰ Ibid.

municipalities with 627,000 people.¹¹ In March 2002, a program was approved to be implemented called, Sierra Norte de Puebla Integrative Development Program.¹² Data from this project research demonstrated that 80 percent of the population lacked of basic services and earned an income lower than the minimum income.¹³ The houses have little or no sanitation. Life conditions are difficult. There are 30,000 landowners that produce coffee in 42,000 hectares.¹⁴ The inefficiency in the producers' organizations causes low productivity.

The coffee plantations in the Sierra Norte were expanding until the market prices decline with the coffee economic crisis due to international devaluation of coffee.¹⁵ In lands lower than 200 m tobacco is produced, citrus, guava, mamey, pineapple, plantain and many others tropical fruits. Livestock is an issue of social conflicts and people opt for not having cattle or horses in their lands. In these areas the nahua's population is experiencing significant cultural changes through the assimilation of modern life.¹⁶

4. Atla a community in the Sierra Norte of Puebla

The Sierra Norte the Puebla in prehispanic times was part of Totonacapán, which included Pahuatlán. When territorial limits were assigned, Pahuatlan municipality and the ex-district of Huachinango maintained borders with the Poblana Huasteca.

¹¹ Ramon Rivera-Espinoza. "Programa de Desarrollo Regional Integral y Autogestión Local en la Sierra Norte de Puebla". <http://www.tuobra.unam.mx/publicadas/040507180936.html#fn11> (accessed September 19, 2006)

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Lourdes Baez, 2004

¹⁶ Ibid.

The Huasteca also borders the Cazonos (San Marcos o Chila) river. This river begins in between Huachinango and Pahuatlan.¹⁷

Montoya-Briones describes that the first inhabitants in Pahuatlan were Huastecos and Totonacos. When the Totonacos lost political and military power due to the chichimecas and olmecas-mexicanos invasions, Pahuatlán became a territory for the Aztecs, the Otomies and a few Totonacos. In 1532, the first missionaries also visited Pahuatlan were Augustines. The Santiago Pahuatlán church is located where funded the first small convent.

The publication from the Universidad de las Americas Puebla , “Expresiones del sincretismo religioso en la muerte Nahuatl”, relates that in 1861, Pahuatlán was elevated to a local municipality and was subdivided so that Villa: Pahuatlán del Valle became the central villa and a *mestizo* town. In 1964 Pahuatlán was one of the 15 municipalities that integrate the Huachinango district (See Appendix B).

The first 10 villages of Pahuatlán were: Atla (Nahuatl), Acalapa (mestizo), Ahila (mestizo), Atlatongo (Nahuatl), Cuauneutla (mestizo), Mamiquetla (Nahuatl), Tlalacruz (mestizo), San Pablito (Otomi), Xolotla (Nahuatl), and Zoyatla (mestizo) (Montoya,1964).

Professor Montoya-Briones, an anthropologist from INAH, currently estimates that Atla has approximately 3,000 people.¹⁸

The word Atla is derived from *atl*, water, and means “place where there is water”. Pahuatlán and Atla are separated by one of the rivers flowing from Cazonos or San Marcos, which ends in the Mexican Gulf. Pahuatlán and Atla are in opposite mountain

¹⁷ Jose Montoya-Briones. *Alta: etnografía de un pueblo Náhuatl*. (Instituto Nacional de Antropología. Mexico, D.F.,1964).

¹⁸ Jose J. Montoya-Briones, Interview by the author, August 29, 2006.

regions, so they are easy to distinguish. To the north, Pahuatlán borders with Hidalgo State, to the north-west with Chila Honey municipality, to the south and the east with Tacuilotepec municipality. All these municipalities belong to the Puebla State. Atla is located at the base of three main peaks: Metztepetl, Huehuetepetl (huehue = old and tepetl = peak) , Soapiltepetl (soatl = woman and tepetl = peak) or Cerro Boludo.¹⁹

The Sierra Norte presents tropical climate in the State of Puebla are identified 11 different type of climate. The Sierra Norte has a lot similarity with many of the regions in Latin America.²⁰

4.1 Atla in the context of an agricultural community in the region – What do they produce?

Atla, as many other communities in the Sierra Norte de Puebla, is characterized for being a high-margin poverty region as shown in Appendix C. Baez has identified many of the Sierra Norte of Puebla communities as a labor expeller zone, rather than a labor attractive one to its inhabitants. Often in the past, the inhabitants went to nearby cities to work in the coffee farms or *haciendas*, to collect coffee.²¹ For long time coffee collection was a great source of income at all economic levels. On the publication, Nahuas de la Sierra Norte de Puebla , refers that the big *haciendas* located in Zihuateutla, Jopola, and Xicotepec used to provide work to thousand of *campesinos* who came with their family to work during the harvest season.²² The coffee depot center generally received coffee sold by small parcel proprietors. Due to the loss of coffee international

¹⁹ Montoya-Briones,1964

²⁰ “Enciclopedia de los municipios de México, Puebla: Medio Físico”. Centro Nacional de Desarrollo Municipal. http://www.emexico.gob.mx/work/EMM_1/Puebla/21000c.htm (accessed September 29, 2006)

²¹ Lourdes Baez, 2004

²² Ibid.

market share, the coffee became priced low. Baez refers that a 1 kilogram of coffee was sold for US\$ 1.00. In Atla, the *campesinos* told me that they received offer as low as 2.00 pesos (approx. US\$ 0.20) for a *cuartillo*, which is approximately 1 kilogram.²³

Today, the indigenes harvest only a sufficient amount of agricultural products for their own consumption. Furthermore, Atla was a sugarcane producer; the sugar mills have now been abandoned. Again, the sugar prices fell down and the sugarcane fields are no longer plowed. The families also have vegetables and fruit gardens at home. In Atla, they produce ginger that grows like weed in their home backyard. Yet, they have little knowledge of the properties of ginger. In many instances, their lack of knowledge causes not to take advantage of their resources' properties to help their nutrition and health.²⁴

4.2. *The women handicrafts and their costumes*

According to Barabas in the book *Dialogos con el Territorio*, the indigenous women in Puebla represent through their designs the cosmos in visualization. The design on their embroidery is an abstract graphical representation of the universal space, which is deeply observed among the nahuas.²⁵ A symbol of the cosmovision is represented on the clothing embroiders' design. In the feminine fashions colors vary from community to community. For instance, in Atla they used to work with a backstrap loom or *telar de cintura*, producing unique designs and textile fabrication. Due to the complex of the process and cost of the materials, they have left aside this tradition. Montoya-Briones refers that in Atla there were about 7 women, who use the backstrap weaving technique

²³ Jose Montoya-Briones, 1964

²⁴ Lourdes Baez, 2004

²⁵ Alicia Barabas, ed., *Introduccion: Una Mirada etnografica sobre los territorios simbolicos indigenas*. 2003. *Diálogos con el territorio: Simbolizaciones sobre el espacio en las culturas indígenas de México*. Vol. 2. (Instituto Nacional de Antropología. 2003): 20-22.

to weave the belts. Today in Atla, there is only one woman, who still weaves using the backstrap loom in this community. A belt, *cinto* or *faja* costs around 250 pesos (approx. US\$ 25 dollars). The belt measures at least 2 meters long and wraps around the waist to hold the skirt. The basic designed color is a red background with black embellishments. Baez indicates that the white blouses were introduced in the thirties. The design and the material utilized to do the embroideries on the sleeves and collar vary according the region. The embroidery is a combination or machine stitches and hand needlework. The blouse is called *quezquemilt* in Nahuatl or *huipil*.²⁶ The nice garments are worn by all the women in the local religious festivities. The old women every day wear their traditional outfit: black skirt, belt and white top. The younger mothers wear regular black skirt up to their knees and a regular white top. The girls, between 13 years old and 18 years old, they dress similar to the city girls. When women with their children come from the Sierra to the town plaza to sell their handcrafts, one observes them wearing their regional costumes. When women go out, they put on a black shawl or *rebozo*. They wear black plastic closed toe shoes with peep toe caged style holes. This shoes made in China cost 25 pesos (approx. US\$2.50 dollars) and are the only they can afford. The local leather sandals or *huaraches*, cost 90 pesos (approx. US\$9.00) too costly for them to purchase. The sources of income are limited.

There are plenty of opportunities to foster plans addressing problems related to poverty and underdevelopment. International Fund for Agricultural Development²⁷ recognizes the indigenous communities are experiencing what they identify as “hard

²⁶ Lourdes Baez, 2004.

²⁷ “IFAD strategy for rural poverty: Latin America and the Caribbean, regional overview”. International Fund for Agricultural Development (IFAD). 2002. <http://www.ifad.org/operations/regional/2002/pl/pl.htm> (accessed February 10, 2007).

poverty”, which means little or no schooling, limited knowledge to promote production, and low technical abilities. The Secretary-General of United Nations in the document “Draft Programme of Action for the Second International Decade of the World’s Indigenous People” recommends: “In capacity-building programmes and projects addressed to indigenous peoples, special attention should be paid to leadership training for indigenous women”.²⁸ Improving handicrafts skills, marketing instruction in creating a value added for their product is economic development within the scope of this project.

5. The housing setting

The housing in the rural areas is of very simple construction. The houses have two big rooms. One room is for the stove and family gatherings. The second room is the bedroom. The kids sleep on the floor on a mat made out of palm called *pepextles*.²⁹ The houses are built with brick, wood or adobe. They use tile for the roof or metal sheets. The stove is hand made with two separating brick stacks holding up a flat wooden board that conforms a box about 3 inches deep. I they fill it with dirt mixed with ashes. On the center, a triangular grill or 3 stones are positioned to hold the flat clay pan, or *comal*, or other pots over open fire. Since this stoves, or *estufas* requires wood, inside the house or kitchen can get really smoky. Some houses have the kitchen a separated room. Generally it is built with wooden boards or sticks. However, still, these stoves generate a lot of smoke. Therefore, it is unhealthy for their eyes and lungs. These are the typical house construction in rural less developed countries throughout Latin America. One of the socio-cultural concerns is diminishing of community sense. People gather around the room where the stoves as a social gathering, heating and cooking and eating.

²⁸ United Nations, 2005: 12

²⁹ Jose Montoya-Briones, 1964

6. Biomass and the conventional stoves

Direct combustion is the method used since primitive time as a source of thermal energy. Biomass still remains a major source of energy in rural areas of developing countries. Indoor air pollution causes significant health problems for the 2 billion people worldwide that rely on traditional biomass fuels for their cooking and heating needs.³⁰

Robles-Gil refers to the increasing demand of fuel wood and the insufficient reforestation in some areas has caused biomass to become scarce, causing a rural energy crisis that

Rady (1992) named as 'fuelwood crisis'.³¹

Jas Gill stated, "Population pressure in developing countries is believed to be the predominant cause of deforestation due to dual needs of food and fuel." Providing solutions to meal cooking is a priority among their needs.³² For years, the rural population has observed the most rudimentary arrangement for food cooking. The improved stoves study conducted by Gill provided a variety of information related to examining the failure of improved stoves popularity in general. Gill, stated of that being able to cook quicker was the main villagers concern. The popularity of the stoves of has been rather weaker than one could expect. Yet, they failure is also attributed to inefficiency versus the traditional method of cooking. Furthermore, misconceptions about cooking speed of the improved stoves were among the user failed expectations to higher efficiency. In many instances, the villagers' lack of interest did not meet

³⁰ Dr. Mark Bryden, et al. "Design principles for wood burning cook stoves." Aprovecho Research Center-Shell Foundation- Partnership for Clean indoor air.
<http://www.repp.org/discussiongroups/resources/stoves/Pcia/Design%20Principles%20for%20Wood%20Burning%20Cookstoves.pdf>. (accessed November 16, 2006)

³¹ Sandra Robles-Gil. "Climate Information for Biomass Energy Applications." *Comission Nacional del Agua- Commission for Climatology World Meteorological Organization*. 2001.
<http://www.wmo.ch/web/wcp/clips2001/html/Biomass%20Energy.pdf> (accessed November 21, 2006).

³² Jass Gill. "Stoves and deforestation in developing countries". (UK-ISES conference- "Energy for Development-what are the solutions?", 1985):1.

their real needs, such as the health issues the new stoves address. Gill emphasizes that using the land for agriculture, cattle ranching, and lastly firewood collection are contributing factors in the progression of deforestation.³³

6.1. Cooking with improved stoves

Among the indigenes firewood stoves are typical of stoves used to cook their food. The rural population is increasing and simultaneously the deforestation of the nearby mountains keeps increasing.

Since 1976, stoves have been a subject of intensive research.³⁴ Among the most renown stoves are the Lorena developed in Guatemala in 1979, and the Rocket model developed in 1997.³⁵ In 1995, the grill for the Justa stove was designed by Rogerio Miranda and PROLENA/Honduras. In 1999, the formal Justa stove design was implemented.³⁶ The research on this subject has being going on for years. In the Sierra of Mexico, it seems that simple passive technology is slowly moving throughout the sierra.

Many other stove improvement projects have been carried out with a variety of designs. The goals are to provide a healthy environment and to cook efficiently. Table 1 shows the efficiency of some of these designs implemented in Latin American countries: Lorena, Dona Justa, Rocket, Rocket partial skirt, Amigas con la naturaleza.³⁷ In Chiapas, Mexico, a pilot project was carried out. The costs and efficiency was compared with a bucket type of design, and a mud and block type as shown in Table 2. On Table 3 the

³³ Ibid.

³⁴ Dr. Mark Bryden, et al., 6

³⁵ Ibid.

³⁶ Dean Still. "From La Lorena to la estufa de Dona Justa." *Rethinking the Latin American Cookstove*. <http://www.efn.org/~apro/AT/atstovereport.html> (accessed October 19, 2006)

³⁷ Ibid.

savings according to the type of construction is the efficiency was recorded for the same types of designs.

Table 1 - Stove preliminary data mostly produced in the spring of 1999

Stove preliminary data mostly produced in the spring of 1999	
Stove	Efficiency
Rocket stove	13%
Rocket Stove /Partial skirt	23%
Rocket stove full skirt	36%
Three stone fire 1 pot	11%
Lorena 1 pot	5%
Lorena 5 pots	10%
Estufa Justa 1 pot	5%
Estufa Justa 3 pots	16%
Estufa 5 pots	20%
Estufa Justa de dos hornillas 1 pot	10%
Estufa Justa de dos hornillas 3 pots	23%
Justa profunda 3 pots	35%

Table 2- Stove construction costs

Types of stoves and wood saving			
type of stove	sticks/ day after	sticks/day before	savings
cylindrical bucket	7 to 9	18 to 20	55%
conic galvanized bucket	7 to 9	18 to 20	55%
tin bucket	7 to 9	18 to 20	55%
with oven	5 to 7	15 to 20	65%
mud and cement	9 to 10	18 to 20	50%
block and mud	7 to 9	18 to 20	55%

Table 3 – Types of stoves and wood saving

Construction costs	
Type of stove	Cost (pesos)
block and mud	40
conic galvanized bucket	65
tin bucket	65
cylindrical bucket	70
mud and cement	100
Atlatl project	300
with oven	600

The poverty and marginalization of the indigenous communities have raised concern at international forums (e.g. IFAD 2002; United Nations 2005). Based on these precedents, the motivation of this project is to deliver practical instruction to indigenous women and to build an improved stove. The project pursues five objectives related to economic and social development and introduces sustainable technology. The significance of the project depicts the importance to respond to the indigenous women needs, which will require flexibility and creativity.

Methodology

The core of the Atla community project in the Sierra Norte of Puebla, Mexico, designed for this study is a one person project including the necessary skills to introduce development in an indigenous community, given limited time and resources.

The activity planning includes accomplishing several goals in an interdisciplinary project where broad skills, experience, and knowledge are combined to produce the synergy necessary to lead, manage, serve, and collaborate.

Observation plays an important role in the development of every stage to successfully respond the need of the villagers. The data will be collected and consecutive implementation plans will be applied. Since there is a limited time for the plans' execution, the activities must be efficiently organized and managed.

1. Project proposed cycle plan

The plan and objectives of the project to attain sustainability will be challenged by reaching a progress in social development, economic development, and sustainable technology with passive systems designs. The flow chart in Appendix D graphically describes the proposed sequence of a closed cycle activities that will be followed in the project. Adding handcrafts skills and improving current handcrafts skills will strengthen and preserve the indigenes cultural identity; therefore will stimulate social development. In order to sustain their economy, the indigenous community of Atla will have to be prepared to compete with their products in the local and international market. Marketing techniques and pricing will be taught to indigenous women. Then, economic development will be begun to happen in the indigenous community. Lastly, sustainable technology will be introduced utilizing passive systems designs. This project proposed a

closed loop plan that encloses social development and economic development that converge in the third step, which is sustainable technology.

2. Organizing the project

This community/volunteer project's name is "Hands on Development" (HoD). The initiative is put into practice by the passion and commitment of volunteers with common goals focused on service. Cultural identification with the indigenous people in less developed countries consists of spending time with them, living with them, and eating their food. Finding a common ground for understanding is the first step to building a relationship with each other.

During the planning stage two goals have been established: a short term goal and a long term goal. The overall goal is to empower indigenous women in the rural community of Atla through training and education and improve their living conditions. Furthermore, the goals will include creating mechanisms to solve community problems and contribute to build a sustainable community. The project's immediate goal will be to teach and support this small group of indigenous women in Atla, Puebla, through meeting the following objectives:

- 1) Distribute material and supplies to conduct a hands-on training.
- 2) Provide the indigenous women the opportunity to participate in training workshops, in order to gain some additional handcraft skills.

The long term goal is to combine a set of skills:

- 1) Developing marketing techniques to facilitate the indigenous women in earning additional income.

- 2) Distributing useful information, so the indigenous women learn the benefits of a cooperative association.
- 3) Learning about their harvest techniques and housing construction.
- 4) Assisting them with the appropriate information and training to build a sustainable community.
- 5) Teaching the indigenous women new skills.
- 6) Constructing a pilot project of an improved stove to pass on techniques to similar communities.

Implementation

The proposed closed cycle plan was tangible and the objectives were achieved during the implementation of this project. The activities were executed involving all the participants in the decision-making process. A milestone of inclusiveness marked the beginning of a highly productive venture. The uniqueness of Hands of Development project is a tridimensional approach enclosing economic, social, and sustainable technology development. Furthermore, prioritization is essential when adopting sustainable solutions. The imperative leadership skills is exercised to launch the initiative and to engage other members with passion.

1. The Closed cycle implementation plan

The implementation plan is illustrated on a flowchart in Appendix E. Hands of Development initiates with an observation trip leading to a decision point inquiring the type of training needed. Specific workshops were conducted to bridge the gap between simple handicraft production to unfamiliar marketing and pricing techniques. Delivering educational training and hands-on practices met the expected goals. The indigenous women receive the entrepreneurial education that generates additional income.

Another contributing milestone of this closed-cycle process is the feedback step. The commentaries and discussion with the indigenous women generated valuable feedback information. The first workshop produced the necessary feedback to create the loop. The indigenous women engaged the process participating with ideas to prepare for the next workshop. The type of training needed and the feedback steps will support the entire process to obtain the desired results.

Phase I addressed economical and social issues of the community. This phase covered theory and practice, which directly benefited their skills. They gained handicraft skills, marketing, pricing, and cooperatives. Phase II addressed issues related to sustainable living (environment and health). The construction of an improved stove is sustainable passive design, which is easy to build and easy to maintain.

2. The project management

This project was conducted by integrating all different components necessary to put together the entire system to successfully run as a business enterprise. The components included: preparation, proposal, gathering resources, workshops trips, progress reports, evaluations, and final report.

3. Preparation

The preparation consisted on an exploratory trip to the indigenous community to learn about their customs, skills, and how they support their families. Finding a link to connect with the women was important in order to become accepted among the group. In the area, community struggles are obvious; the lack of sanitary and basic infrastructure is nowhere to be found. Since the women are the cash providers it would seem more logical to provide training workshops to help the women from this depressed area.

The supplies, tools, and techniques the indigenous women utilize in the needlework, are important components to carry on their work. These aspects were evaluated to support and possibly offer a variety of methods to streamline their production processes. At the end of the visit, we agreed upon additional visits to help implement training and new methods of production.

4. Business plan/proposal

In order to continue with the plans it was necessary to prepare a proposal. The plan was about how to gather the resources for the first workshop. All businesses require a business plan and all funding require a proposal. There were two targets to aim. For this project, a combination of both concepts was put in practice. A power point was the software tool destined to transmit the message. The proposal included a mission statement, a vision, a background, current scenario, the objectives, a workshop budget, a map of the area, and a lot of pictures.

5. Gathering resources

Economic resources and human resources were two types of efforts to meet in different ways. The challenges both resources presented were reached through the promotion done on the proposal writing. The budget was prepared based on samples purchased at wholesale stores in downtown. The funding was provided by private donors. Networking helped to withdraw guidance in where/who to contact in the recruiting process of skilled laborers. Each workshop was customized, therefore plans were prepared once the previous workshop concluded. The bookkeeping was meticulously observed.

6. Workshop trips

The Hands on Development project was conducted in a 3 month period. There were four workshops and one construction project. Workshop I began when a church leader welcomed the idea and announce the visit in Nahuatl language to the community. The community leader also invited the women from the church leadership ministry to

participate in an information meeting. For two consecutive days indigenous women learned new handicraft techniques and the use of new material. Before closing the workshop I, a request to present a finished product at the next visit with the materials they just received. The supporters of this project expected to see the results. It was important to include everyone and assign roles to complete this venture.

At workshop II and workshop III, the project has gained momentum and the women were more receptive. Again, two days were dedicated to each of the sewing workshops. A professional seamstress facilitated the training. Fifteen items were distributed to assist the women with the task of designing and sewing a garment.

Workshop III had the intention to introduce sustainability in the house by changing the stove or *brasero* with an improved stove made out of brick and having two burners. The activity objectives were to make it affordable, functional, and easy to build. The *brasero* area is where family and friends gather to share their meals. With the family's approval building the new improved stove was possible. Furthermore, the objectives were attained.

7. Progress report

Immediately after each trip, a progress report was completed. The distribution was electronically mailed in English and Spanish. Keeping the donors and volunteers informed about the workshop advancement established credibility and they continue to receive their support. A progress report included a variety of information: daily workshop activities, interviews, outcomes, future plan, and budget. Unfortunately the indigenous people are missing electronic media in their village and none of these reports were shared with women.

8. *Evaluation and decision-making*

While it was important to organize this venture, involvement of the participants was just as valuable. In the closed loop cycle, the type of training step evaluates the feedback and predetermines the direction of the follow. Then, the next visit was scheduled and announced. Enough preparation days were contemplated to be able to gather all the resources. No promises were delivered to the indigenous women, just the approximate return date.

9. *Final report*

The final report enclosed a summary of the entire project. An acknowledgement section to recognize all the donors and volunteers was on the front page. The highlights of the community agricultural products, economy, and social facts were published. Most importantly, the report included specifics about the workshop's goals and results.

Table 4 below displays the project costs of the supplies only. The time required to prepare each workshop in days and weeks. The total amount needed for similar projects as workshop I and workshop II. A 5% increase to the original amount spent to cover inflation. The numbers 1, 6, and 26 means the numbers of similar projects that potentially could be executed. This table was prepared to show the possibilities to replicate similar projects in number of 6 or 26 in one year.

Table 4 – Project total cost for only supplies

Project costs - supplies only			
Projects	1	6	26
Preparation week	1	6	26
Total weeks	2	12	52
Days	15	84	364
\$ amount	400	2400	10400
US\$ total +5%	420	2520	10920

Recommendations

The Hands on Development project model centered in to utilize a professional education and apply an accumulated theory with the significance to cause positive change. To accept the challenge is to decide adopting and adapting a deprived community to promote sustainable development.

Since this is a pilot project, an analogy is to be made with harvesting, which is to collect the fruits and move one step forward to examine the color, taste, and size. The process implies measuring the outcomes. Refining the process implies improving the acquisition of supplies, and obtaining the financial support to continue impacting villages.

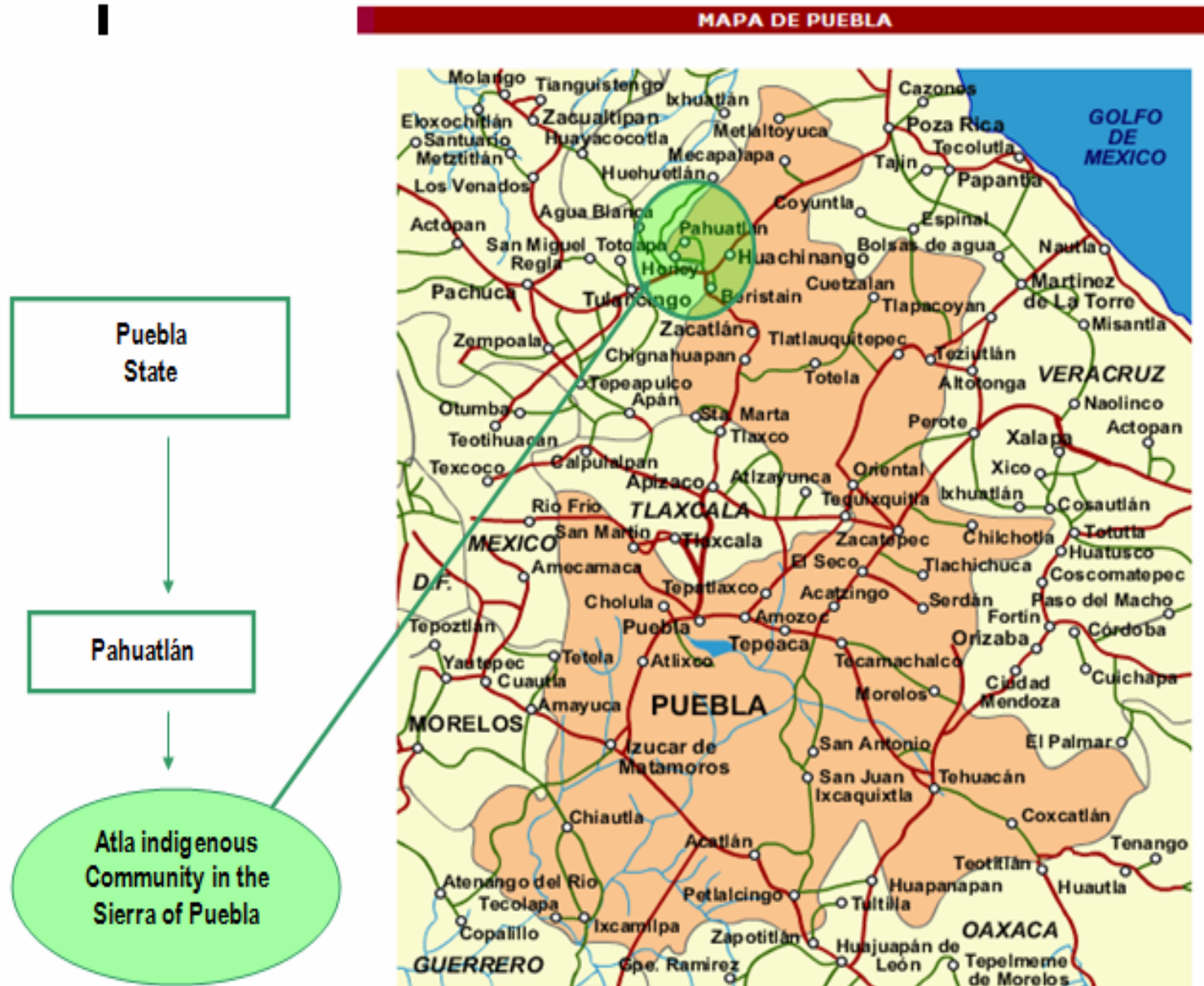
APPENDIX A

Puebla State in Mexico



APPENDIX B

Pahuatlán geographical location



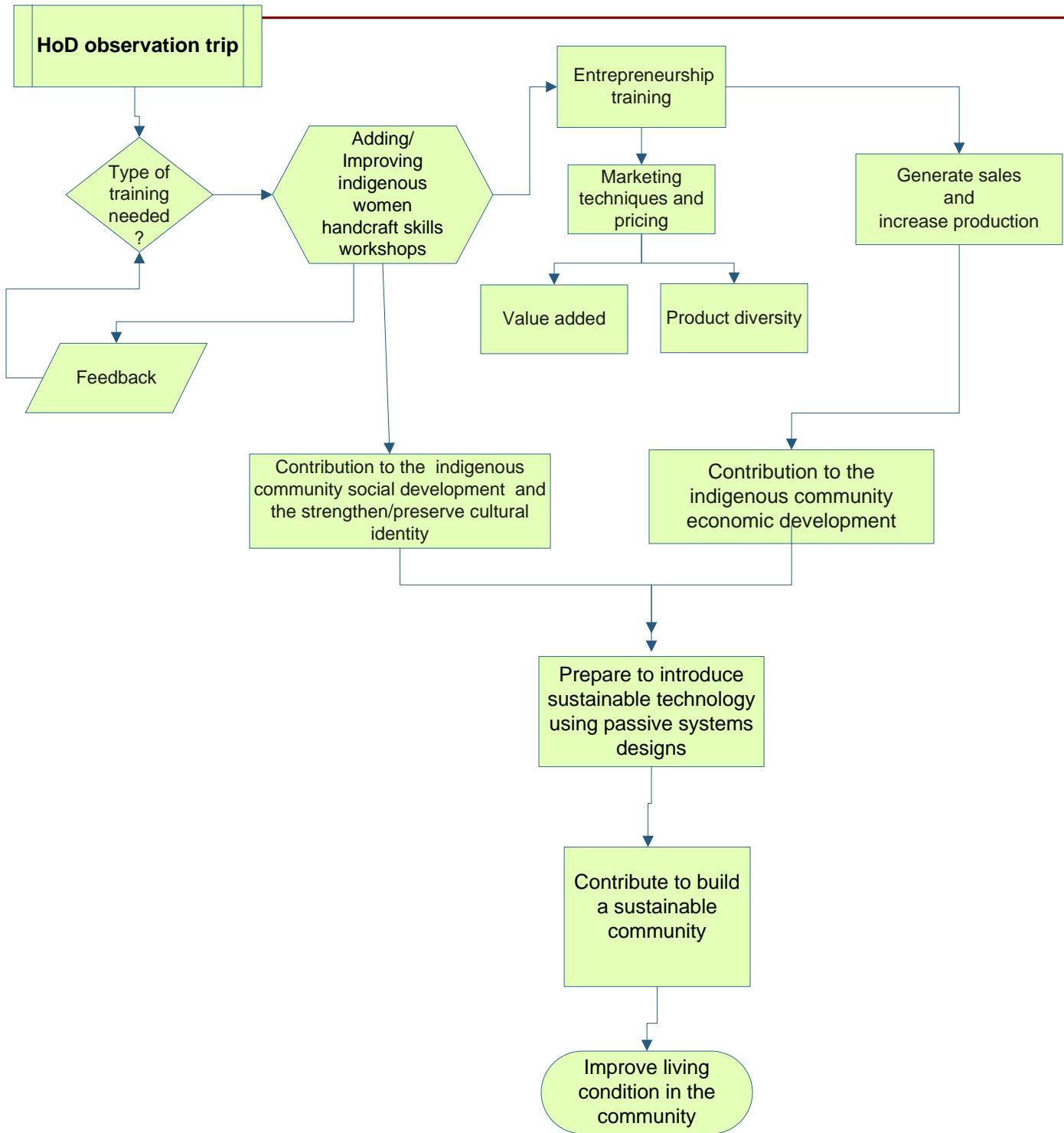
Appendix C

Pahuatlán municipalities: Population, income, housing, spoken language and index of marginality

MUNICIPIO		LOCALIDAD		POB. TOT.	HABLANTES DE LENGUA INDÍGENA		POBLACIÓN OCUPADA			% POB. OCUPADA QUE RECIBE MENOS DE 2 SM	VIVIENDAS PART.	PROM. DE OCUP.	% DE VIVIENDAS PARTICULARES				CARRETERA A MENOS DE	MARG. DEL MPIO.	MARG DE LA LOC.	
							TOT.	INGRESOS EN VECES AL SALARIO MÍNIMO					INCLUYE A LOS QUE NO RECIBEN	AGUA	DREN.	SANIT.				ELEC.
CVE	NOMBRE	CVE	NOMBRE	TOTAL	%	NO RECIBEN		MENOS DE 1	DE 1 A MENOS DE 2	SIN.										
109	PAHUATLAN	1	PAHUATLAN DE VALLE	3,208	137	4.27	1,166	205	341	322	74.44	704	4.4	10.23	30.97	25.00	9.38	Con carreteras	Alto	Medio
109	PAHUATLAN	2	ACALAPA	572	11	1.92	187	11	146	22	95.72	112	5.0	26.79	88.39	25.00	15.18	Sin carreteras	Alto	Alto
109	PAHUATLAN	4	AHILA	281	13	4.63	76	9	50	12	93.42	66	4.1	46.97	96.97	56.06	7.58	Con carreteras	Alto	Muy Alto
109	PAHUATLAN	5	AHUACATITLA	238	6	2.52	104	26	42	27	91.35	54	4.2	1.85	22.22	29.63	5.56	Con carreteras	Alto	Alto
109	PAHUATLAN	6	ANGELES, LOS	235	1	0.43	87	21	53	9	95.40	38	6.0	36.84	97.37	23.68	5.26	Sin carreteras	Alto	Muy Alto
109	PAHUATLAN	7	ATLA	1,697	1,347	79.38	431	126	230	47	93.50	359	4.6	16.43	29.25	32.59	16.16	Con carreteras	Alto	Alto
109	PAHUATLAN	8	ATLANTONGO	790	628	79.49	192	23	112	38	90.10	147	5.3	76.87	97.28	13.61	8.16	Sin carreteras	Alto	Alto
109	PAHUATLAN	9	CUAUNEUTLA DE LA PAZ	715	2	0.28	228	82	86	32	87.72	153	4.6	35.29	75.16	45.10	26.80	Sin carreteras	Alto	Alto
109	PAHUATLAN	10	MAMIQUETLA	323	260	80.50	87	6	62	12	91.95	72	4.5	40.28	100.00	9.72	11.11	Sin carreteras	Alto	Muy Alto
109	PAHUATLAN	11	MONTELLANO	248	9	3.63	88	36	46	3	96.59	51	4.5	92.16	80.39	19.61	19.61	Sin carreteras	Alto	Muy Alto
109	PAHUATLAN	12	NARANJASTITLA	47	0	0.00	19	1	9	4	73.68	14	3.1	42.86	100.00	71.43	21.43	Con carreteras	Alto	Alto
109	PAHUATLAN	13	PACIOTLA	446	7	1.57	147	21	72	47	95.24	95	4.6	18.95	72.63	51.58	18.95	Con carreteras	Alto	Alto
109	PAHUATLAN	14	SAN PABLITO	2,770	2,229	80.47	1,114	45	787	217	94.17	544	5.0	21.14	14.71	16.36	6.62	Con carreteras	Alto	Alto
109	PAHUATLAN	15	TLALCRUZ DE LIBRES	966	9	0.93	243	76	153	12	99.18	215	4.4	27.91	63.72	27.91	31.16	Sin carreteras	Alto	Alto
109	PAHUATLAN	16	XILEPA	202	1	0.50	67	21	28	9	86.57	46	4.1	2.17	36.96	10.87	4.35	Con carreteras	Alto	Alto
109	PAHUATLAN	17	XOLOTLA	2,406	1,898	78.89	900	370	433	62	96.11	514	4.6	40.66	84.24	33.46	12.84	Con carreteras	Alto	Alto
109	PAHUATLAN	18	ZACAPEHUAYA	181	128	70.72	39	17	16	1	87.18	40	4.3	10.00	92.50	37.50	12.50	Con carreteras	Alto	Alto
109	PAHUATLAN	19	ZOYATLA DE GUERRERO	959	28	2.92	259	96	72	72	92.66	208	4.5	20.67	52.88	20.19	9.62	Con carreteras	Alto	Alto
109	PAHUATLAN	20	XOCHIMILCO	712	576	80.90	352	52	270	15	95.74	159	4.4	24.53	94.97	20.75	27.67	Con carreteras	Alto	Muy Alto
109	PAHUATLAN	21	LINDAVISTA	183	1	0.55	52	33	14	3	96.15	38	4.5	89.47	94.74	65.79	44.74	Sin carreteras	Alto	Muy Alto
109	PAHUATLAN	22	ACAHUALES (EL AGUACATE)	179	2	1.12	43	9	14	13	83.72	42	4.2	38.10	83.33	35.71	11.90	Con carreteras	Alto	Alto
109	PAHUATLAN	23	AGUA DEL CARRIZO	40	39	97.50	19	9	8	2	100.00	10	4.0	90.00	100.00	50.00	20.00	Con carreteras	Alto	Muy Alto
109	PAHUATLAN	24	AGUA NEGRA	108	92	85.19	41	6	25	8	95.12	19	5.7	21.05	100.00	52.63	10.53	Sin carreteras	Alto	Alto
109	PAHUATLAN	25	ALMOLOYA	214	6	2.80	77	13	37	22	93.51	48	4.4	20.83	60.42	29.17	14.58	Con carreteras	Alto	Alto
109	PAHUATLAN	26	ARENAL, EL	163	5	3.07	40	16	18	4	95.00	37	4.3	32.43	59.46	51.35	13.51	Con carreteras	Alto	Alto
109	PAHUATLAN	27	AYOTITLA	58	0	0.00	17	6	9	2	100.00	11	4.9	18.18	72.73	27.27	18.18	Con carreteras	Alto	Alto
109	PAHUATLAN	28	CHIPOTLA	65	4	6.15	31	13	8	8	93.55	17	3.8	5.88	58.82	52.94	5.88	Con carreteras	Alto	Alto
109	PAHUATLAN	29	LOMA, LA	70	4	5.71	18	1	3	11	83.33	16	4.1	31.25	31.25	18.75	12.50	Con carreteras	Alto	Alto
109	PAHUATLAN	31	PARAISO, EL	41	0	0.00	13	3	3	5	84.62	7	5.3	0.00	0.00	0.00	0.00	Con carreteras	Alto	Alto
109	PAHUATLAN	32	AGUA DEL MACHETE	125	101	80.80	46	32	11	3	100.00	24	5.0	37.50	58.33	16.67	8.33		Alto	Muy Alto
109	PAHUATLAN	33	TLACUILOLCO	38	0	0.00	11	0	4	4	72.73	6	5.7	50.00	50.00	50.00	0.00		Alto	Alto
109	PAHUATLAN	34	XOPANAPA	46	0	0.00	9	0	6	2	88.89	11	4.2	0.00	100.00	90.91	0.00		Alto	Alto

APPENDIX D

Hands on Development (HoD) Project proposed closed cycle plan



Appendix E

HoD Implementation plan: A macro view

