

# THE INITIATION AND EXTENSION OF VETIVER HANDICRAFT TECHNOLOGY IN CHINA

Liyu Xu

(China Vetiver Network, P.O. Box 821, Nanjing 210008, China; email: lyxu@issas.ac.cn)

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Soil erosion became a critical issue facing our global society. Totalling 99.7% cropland is shrinking by more than 10 million hectares a year due to soil erosion. One rainstorm can wash away 1mm of soil. It would take 13 tons of topsoil for a hectare-- or 20 years, if left to natural processes -- to replace that loss (Greenfield<sup>1</sup>, 2010). As a result of erosion over the past 40 years, 30% of the world's arable land has become less productive. Because of the uncontrolled runoff there is insufficient potable water for world needs and this situation is getting worse, following increasing population which aggrandizes the demand on land for more food, fiber and fuel, and aggravates rural environment.

Although there are many methods for soil erosion control, over decades' experiences showed that vetiver grass is the ideal plant for soil and moisture conservation, embankment stabilization and environmental rehabilitation.

## 1 INTRODUCTION TO VETIVER SYSTEM DEVELOPMENT IN CHINA

The miracle grass vetiver can play an important role in soil erosion control (Chen *et al.*, 1994), land rehabilitation, earth work protections, etc. Over the past two decades, China Vetiver Network promoted the dissemination and extension of Vetiver Grass Technology (VGT) and Vetiver System (VS) through out the country, through national information service; technology distribution via public mediums; organizing multiple conferences, workshops, and training courses; operating joint field surveys and investigations; arranging demonstrations and bilateral visitations; distributing vetiver seedlings, training materials, mini-grants and awards, etc.(Xu, 2002a).

In the recent years, China Vetiver Network pays more attention to agricultural development and high quality economic trees cultivation with vetiver contour hedges to conserve water and soil (Xu, 1996; 2004). However, since the benefit from erosion control may not be obviously showed in a short time, some farmers are less interested in vetiver. To solve this problem it is needed to help farmers, women in particular, earn direct income from vetiver pruning.

In addition, numerous bio-engineering projects were implemented in China since 1999, which included vetiver grass, with its long and massive roots, for the embankment protection in highway (Xu *et al.*, 2000; Xu, 2002b) and railways (Xu, 2003b), mine tails re-vegetation (Fang *et al.*, 2003), waste water treatment, etc. However there is no efficient way to utilize vetiver leaves.

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<sup>1</sup> Email communication

## **2 MATERIALS AND METHODS**

To introduce vetiver handicraft technology (VHT) to China and to disseminate the technology through out the country a series of training courses were organized by China Vetiver Network in different parts of the country and multiple trainings materials were produced in huge quantities and distributed country wide, in order that vetiver leaves can be used effectively and therefore farmers can get direct income from planting more vetiver grass for soil and water erosion control and engineers can use more vetiver grass for slope stabilization and environmental protection.

### **2.1 Introducing vetiver handicraft technology into china (2007)**

Although vetiver system has been developed and extended for over two decades since 1988 in China, there is no any experience in VHT in China. To help people from other countries to grasp VHT, Thailand and The Vetiver Network International organized international VHT training courses in November 2000 and October 2005 in Thailand respectively. Unfortunately, caused by langue problem no Chinese farmers could attend such courses.

Supported by Evangelischer Entwicklungsdienst e.V. (EED), The Vetiver Network International and ORDPB three Thai experts were invited as trainers to train Chinese farmers on VHT in Longshen County of Guangxi Province.

#### **2.1.1 The Preparation**

Before the training course, China Vetiver Network started a series of preparations:

- ✓ A colorful brochure was prepared to introduce vetiver handicraft production and distributed to local farmers in order to let farmers know the value of vetiver handicrafts and generate their interest in participation of the training.
- ✓ Local project partners were asked to prepare the training several months earlier before the course. This preparation included: the organization of the training course, selection of raining location and trainees, preparation of handicraft materials ( vetiver leaves) and tools.
- ✓ A field survey was undertaken in Jiangxi Province to prepare boiled and dried vetiver leaves to be transported to Guangxi in order to fill the gap for any shortfall of vetiver pruning at the training location.

To ensure the training to be more effective and successful, Leading Group consisting of directors of institutions and governmental bureaus from Guilin City, Longsheng County, and Sishui Township government was established. Besides, an Implementation Group from the Township Agriculture Extension Station and County Agriculture Bureau were organized. Each group has its detailed responsibilities.

#### **2.1.2 The training structure**

The training structure included:

- Key presentations introducing the main procedurals of VHT,
- Poster presentations showing vetiver characteristics and its different use in China and in the world,

- Exhibition of handcraft products from Thailand,
- Power-point and VCD performance,
- Hand to hand practice,
- Short meetings and group discussions,
- Exhibitions and evaluation of trainees' handcraft products,
- Questionnaire and conclusion,
- Extended training by the trainees and through information distribution,
- Tentative sale of handcraft products at local roadside market.

The detailed arrangements of the training process contained:

- ◇ Introduction to vetiver handcraft and the preparation of vetiver leaves (2 day)  
(cutting, selection, boiling in water and drying in air)
- ◇ Making of the mold for hats, boxes, trays, baskets, etc (1 day)
- ◇ Making of vetiver handcraft products  
Boxes and trays (2 days); Hats (3 days); Baskets (3 days)
- ◇ Handicraft finishing and decorating (1 day)
- ◇ Sulfur fuming and lacquer glazing (1 day)
- ◇ Final evaluation and awarding (1 day)

### **2.1.3 The Opening of the training course**

On 22 October 2007, the Opening Ceremony of the Vetiver Handicraft Training Course was held in Lipai Village. In addition to leaders from Guilin City, Longsheng County, and Township governments, reporters from TV stations or newspapers from Guangxi Province, Guilin city, and Longsheng County attended the ceremony. Their active involvement generated great impact in the province and in the country when numerous reports were shown on newspapers, TV, and internets at county, city, province and country levels. All of the attendees expressed high interests in the training course and the thanks to the multiple international donors, domestic cooperative institutions, and Thai trainers.

The head of Thai delegate Mr. Pitaya Srijanglong was invited to present an address. He briefly introduced vetiver handicraft techniques in Thailand, including:

- Post-harvest treatment of vetiver leaves
- Training on how to make vetiver handicrafts
- Handicraft products after receiving training
- Animal figures made from vetiver leaves
- Vetiver handicraft contest in Thailand (1996)
- Vetiver handicraft contest and exhibit in Thailand (1999)
- The exhibitions of vetiver handicrafts products development in Thailand
- Bureau of Cottage and Handicraft Industries Development in Thailand

To guarantee the training progresses more smoothly, the Thai delegate brought to China tools, materials, and sample products. Some CDs and printed material were also sent to the Chinese trainees.

Meanwhile, China Vetiver Network introduced the history and development of the Vetiver System in China and in the world, the multiple functions of VS for sustainable agriculture, engineering protection, and environmental protection. The importance of VHT training course was emphasized in order to help farmers get direct profit and generate more

interests in planting vetiver grass.

#### **2.1.4 Poster exhibition for VS extension**

To introduce the Vetiver System more systematically and vividly, a poster exhibition was prepared and shown at the training site. It was divided into four parts:

- (1) General introduction of VS;
- (2) VS for sustainable agriculture;
- (3) VS for engineering and environmental protection; and
- (4) Bilateral visits between China and Thailand on the exchange of vetiver system.

It contained plenty of pictures most of which were taken in China and Thailand and attracted many people from both nearby villages and visiting tourists.

#### **2.1.5 The implementation of the training**

Since the multiple preparations were provided carefully the training was conducted smoothly, from vetiver leave treatment, model design and preparation, to different handicraft products training and production. For most of the trainees, the first product of a small bag was finished in just two days. Then farmers started to learn making more complicated products: multiple containers, hats, baskets, mats, etc. based on different moulds made by Thai trainer.

Meanwhile, some Chinese trainees started to study to make different model with foam plastic materials. At the end of the training course almost all of the trainees could produce at least 3 different handicraft products. Some of them could design and create new products based on their own use and local markets.

To enhance the training to be more effective short meetings were organized every 3-4 days, aiming at problem-solving in order to enhance training efficiency. During the meetings, the trainers asked the participants to compare their products and pointed out the good points and shortcoming of typical examples so that trainees could understand which is good and which is bad, and why. Through comparison the skill was improved very quickly.

#### **2.1.6 Final Evaluation and Awarding**

Before the end of the course, an Evaluation Committee was established consisting of the 3 Thai trainers, 1 from Township Government, 2 from County Agriculture Bureau, 2 from China Vetiver Network, and 1 from local farmers. Moreover, a guideline for final evaluation and awarding was prepared. The parameters considered for awards selection were:

- Material selection: including the color, thinness and length of the leaves, the treatment of the leaves;
- Manufacturing skills: the transition of different parts of a whole product should be done smoothly, without a break, coarse joint or void.
- Decoration: design, the patterns, attached small decoration material, etc.
- Formative level: the whole product should be beautiful as a work of art.
- Complexity: If the product was easy or difficult to make.

At last, on 4 November, the last day of the training course, 10 products were selected

for final evaluation and awarding. Altogether there were 6 successful awardees of which 5 were women.

In addition to cash prize, all of the successful candidates got a set of photos showing different vetiver handicrafts produced in Thailand, that was sent by trainers and reproduced by Guilin partner. These will be very useful for them to design and produce new handicrafts.

### **2.1.7 Impact of the training course**

During the training, reporters from TV and the newspaper visited and interviewed different people and reported the training with different means which led to more people involving in vetiver handicraft and VS. The reports can be found through almost all of China's main internets. As an initiation of VHT in China, it played an important role in introducing and extending VHT in the country.

The training course had a great impact on the local people. The directors of Governments in the nearby townships and counties led delegations to visit the training course and expressed high interests in vetiver grass and VHT and hope to organize training course at their places.

Farmers in Dabie Mountains, 1000km away from Guilin hope to have a training course in their region in order to extend the technology in the mountains that has a large area for about 100,000 km<sup>2</sup>.

The successful training course indicated that to invite Thai trainers to China to teach local farmers is more economical than sending very few farmers abroad to learn.

The most important result was that farmers planted more vetiver grass after the course on the slopes of mountains to conserve soil erosion and to protect their farmland.

## **2.2 Dissemination of vetiver handicraft technology through further training courses (2009)**

The first training course was the most successful. However there still remained some problem to be solved:

- ◆ Although the training course lasted over two weeks, it is not enough for minority farmers to grasp the full technology. Some processes could not be taught during the training, for example the sulfur-fumigating technique. The trainees should practice these themselves.
- ◆ To develop a handicraft market there should be more people to grasp VHT and therefore to produce more handicrafts.
- ◆ It is needed to disseminate VHT to all possible vetiver application area which covered over half land of the country.

As a result, a series of vetiver handicraft trainings were further organized in 2009.

### **2.2.1 The 1<sup>st</sup> training course in 2009 in Batan Village of Guangxi Province**

It was held on 22-28 October 2009 in Batan Village in Guangxi province. Totaling 20 participants involved, most of them attended the handicraft training in 2007. The course provided a good opportunity for them to learn from each other in order to improve their skills through further practice.

Although the course was limited to one week good results were obtained:

- The most popular products the bags and hats were further practiced. Compared with the items produced in 2007 the quality has improved greatly, which indicated that before the products entering market quality should be further improved.
- Since the participants grasped all of the basic technology therefore they could design and produce new products.
- Through visiting local tourism market it is realized that the cheap tourism products have great market potential such as the fan made of grass. The participants started to design similar products using vetiver grass.
- Some farmers designed and produced new products such as vases and small bags (just as souvenirs) which was small and relatively easy to make and may have great potential in local tourism markets.
- The dye technology was discussed among participants. Since the chemicals are alkaline, colorless vinegar can be used to adjust pH value in order that the color can be more attractive and can last longer time.
- The most important was that few trainers were selected which provided prerequisite for further training and VHT extension. Through discussion, the trainers should have following conditions:
  - ✧ Can make at least one product in high quality, in a relatively short time. Awardees from this training course and that from the training in 2007 were in priority for consideration.
  - ✧ Can describe basic procedurals and at same time can practice well step by step.
  - ✧ Have good health, especially when working outside the native county.
  - ✧ Can leave home town for a short time.
  - ✧ Are fond of cooperating with others and are patient in teaching others.

During the course the function of vetiver grass on erosion control was also emphasized. Planting technology was disseminated. To encourage participants to continue handicraft work after the course, vetiver planting materials were distributed to participants early 2010.

The same with the training course in 2007, at the end of the course awardee were selected by voting. The difference was that in 2007 the voting was done by organizers, while this time both organizers and participants engaged in. Each person has one vote. At last 6 participants won awards. Before voting, the parameters were proposed in order that the selection could be more substantial and acceptable.

Almost all of the 20 participants self-nominated as trainers. Based on their skills and health total 6 were selected, of which 4 as trainers for trainings outside their native province.

### **2.2.2 The 2<sup>nd</sup> training course in 2009 in Zhoujia of Guangxi Province**

The second VHT training course of 2009 was organized on 29 Oct. to 11 Nov. 2009 in Zhoujia Village where the Yao minority is concentrated. Totaling over 24 participants attended. Possibly caused by travel difficulties, farmers live in a closed circumstance with little exchange to the outside world and are less interested in learning new technology. The village director told us that we have to be patient working in this area.

In the high mountains the condition was rough. There is no classroom and the training

was held under a corridor. The table was temporarily formed with black boards. Four persons from Batan were invited to be trainers, in addition to another two who were voluntarily attended the course as trainers. For practice convenience, the participants were divided into 3 groups. During training course many villagers visited the spot from time to time which indicated that the Yao minority women are interested in vetiver handicraft but they worry if they can grasp the skill or if the products can find market. Some women considered that VHT could attract more tourists to their village to watch their vetiver handicraft workshop and to buy handicraft products.

Farmers there have to cultivate steeper slope land for food production therefore soil erosion is more serious. Since people there did not see vetiver grass before, to offer farmers vivid image, a clump of living vetiver grass was exhibited. The local organizer guaranteed to distribute vetiver seedlings to them during planting season in order that the handicraft can be sustainable.

At same time the trainers and organizers got preparation for the following training in Anhui province. One simple machine was prepared for making mat and a trainer repeated the practice of making mat to grasp the technique better. Some other tools were also prepared so that the training course can initiate on time and implement smoothly.

### **2.2.3 The 3<sup>rd</sup> training course in 2009 in Changpu of Anhui Province**

#### **(1) The implementation**

In early November 2009 when the 2<sup>nd</sup> vetiver handicraft training was in process in Guangxi Province the Changpu Township Government in Anhui Province which is situated in the Dabie Mountains started to prepare their handicraft training. Based on the self-nomination 22 women were selected as participants, 2 more than schedule. Their age ranged from 20 to 45. Most of them were graduated from junior middle school or primary school, except 2 from high middle school. They came from Ganghe and Shuifan villages respectively. In addition, they selected training site at township in order to generate more impact and prepared necessary tools easily. China Vetiver Network prepared dye chemical, tools and foam-plastic board that were used to make models. To save time, 450kg dry vetiver leaves were prepared before the training course.

The directors from the county and township government attended the opening ceremony. The representative of trainers from Guangxi Province introduced the basic procedure of vetiver handicraft. China Vetiver Network introduced the development of VS in China and the great potential of vetiver for erosion control and slope stabilization in the Dabie Mountains.

In addition the township government established Leading Group consisting of 5 persons responsible for the service of the training. They came from:

- Township Government
- Township Women's Federation
- Township Forestry Extension Station
- Township Culture Center

Their hard work guaranteed the great success of the training course. They provided logistics service and solved problem and provided materials which were needed from time to time. Caused by bad weather, the heavy snow, the local government arranged two

vehicles to collect participants from two villages.

At the end of the training, 9 awardees were selected by voting, which was more than other 2 trainings organized in 2009 since many participants produced good products. In addition, to encourage participants to cooperate each other the government established Cooperation Award for 2 participants who joined together to make mat.

At the end of the training course vetiver planting material were distributed to all of the participants. The government requested them to plant carefully and asked technicians to check the planting quality in order that vetiver handicraft production can be sustainable. During the training course many women from the township request to participate in the course or asked for the products. Meanwhile the township government also expressed their high enthusiasm in organizing additional trainings.

## **(2) The impact of the training course**

Generally, the 3<sup>rd</sup> training was the most successful of VHT trainings in 2009:

- ✓ Although lots of time was spent during the transportation under snow weather, participants made many products, over 6 the most for one person. Some people made a vase in just one evening.
- ✓ Every participant went on working at home in the evening.
- ✓ When the course was finished the left dry leaves were distributed to the participants and all of the persons wished to get more in order to continue their work after the course.
- ✓ During whole course all of the participants stayed all day without absence under the bad weather.
- ✓ The competition was very critical. Each person wished to own award. Some appeared very disappointed when they did not own 1<sup>st</sup> award.

During the training course, short time meetings were organized for several times aimed at solving problems and improving quality. The training course has generated great impact in the Dabie Mountains which is 90-1,700 m above sea level with a total area near 100,000 sq. km, covering 3 provinces including Anhui. The Mountain area remains under developed and forms one of the poorest regions of the country. The training has extended both VHT and VS in the mountains, which is useful for improving farmers' life and controlling soil erosion which is proved to be very serious because the soil is mainly derived from coarse granite with very little clay particles.

## **2.3 Other vetiver handicraft training courses**

In addition to the above 4 training courses organized in 2007 and 2009 respectively, some other training courses were organized to disseminate VHT more extensively and effectively.

### **(1) Vetiver handicraft training course organized by local people (2009)**

To increase farmers income and vetiver applications for erosion control and sustainable farming, the Women's Federation and Agriculture Bureau of Longsheng County of Guangxi Province launched a VHT training course on 28-30 April 2009 in Maluo Village. Totaling 36 female farmers attended the training course. Three local trainees who participated in the first training course in 2007 acted as trainers. Although the period of the course was short caused by tight budget, farmers learned basic technology

and could learn from each other continuously after the training. The training indicated that there is great potential for VHT dissemination in China, while officials realized the importance of VHT.

## **(2) Advanced vetiver handicraft training course in Anhui Province (2010)**

As described above totaling 22 women participated in the training course in Anhui province in 2009. To enhance their skills and to train local trainers an advanced VHT training course was organized in Shuifan Village of Changpu Township on 11-17 October 2010. Totaling 20 woman participates participated, of which 7 women were new participants.

The training course consisted of all of the procedurals needed for the handicraft. All of the participants were encouraged to learn from each other except for few new participants. Before the course 4 old participants who owned 1<sup>st</sup> award or 2<sup>nd</sup> awards during the last training course (No.5, Table 1) were selected as tentative trainers responsible to teaching new participants.

Through one week's training and practice the old participants enhanced their skills, while the new participants grasped basic technology. Besides, some old participants learnt to make models with plastic material and designed and produced new items.

In the last day of the course each participant was asked to send one of her best products for competition and totaling 20 products were provided for awarding, of which 7 were awarded.

In addition, to spread VHT all of the participants were encouraged to nominate themselves as trainers for further training courses. Through self-nomination and discussion totaling 7 women were selected as trainers. It is consider that some of them will be trainers for local trainings, while others for the training courses organized in neighbor counties.

## **2.4 Wide distribution of training materials**

Aiming at distributing VHT and VS more widely through out the country, many training materials were produced and disseminated during the training courses or after the trainings. These materials include:

*Vetiver Grass: The hedge against erosion*, the classical manual introducing vetiver grass.

*Vetiver Newsletter*: produced 4 issues each year since 1996 introducing the progress in various vetiver projects and the development of VS in China and in the world.

*FACT Sheets: Vetiver and Soil Conservation*: introduces how to use vetiver grass for soil conservation.

*Vetiver Research and Development*: a book published in 1998 and introduced VS development in the past 10 years in China.

*Vetiver System and Its Research and Applications*: a book published in 2003 and reviewed VS development in different field in China.

*Vetiver System: its theory and practice*: a book published in 2008 instructing recent VS development in China and in the world.

Multiple publications were produced for different group of people with different background of education and work.

### 3 RESULTS AND DISCUSSION

Totalling 6 vetiver handicraft training courses were organized in Guangxi of west China and Anhui of East China respectively from 2007 to 2010 (Table 1). Altogether 147 farmers participated. All of the training courses indicated that there is high enthusiasm among farmers and great potential for the production of vetiver handicrafts in China. In addition, over 5000 copies of different training materials were distributed.

#### 3.1 Training courses: the most effective way to disseminate VHT

VHT training is different from others. As usual, in the villages one training just takes few hours or one day at most. However, VHT training needs much more time. Additionally, since such training needs *watching and practice* all the time, the number of the participants for each course has to be limited. As a result training courses should be organized from time to time in order that more farmers can grasp the technology.

**Table 1 Vetiver handicraft training courses (2007-2010)**

Number	Time	Location	No. of parti.	Target and Description
No.1	22 Oct. -3 Nov. 2007	Lipai, GX	25	Introduce VHT to China
No.2	28-30 April 2009	Maluo, GX	36	Extend technology in GX by local govsn.
No.3	22-28 Oct. 2009	Batan, GX	20	Improve skills and select trainers
No.4	29 Oct.-11Nov. 2009	Zhoujia, GX	24	Extend technology in GX
No.5	16-29 Nov. 2009	Changpu, AH	22	Introduce technology to AH
No.6	11-17 Oct. 2010	Shuifan, AH	20	Improve skills and foster trainers for further trainings in Anhui Province

GX = Guangxi Province; AH = Anhui Province; parti. = participants

Through these trainings a set of successful training experiences were accumulated, that include the methods, procedurals, preparations of tools and materials, poster exhibitions, power points, training organizations, etc., that provides prerequisites for further trainings that will be launched in the near future.

Except for No.2 which was organized by local authority, all of the training courses contained final evaluation and awarding program, which enhanced the efficiency and encouraged participants to do their best to learn more within limited time. Altogether 26 participants owned awards (Table 2), of which few owned over one award.

It is worth to mention that local governments realized the importance of VHT and started to organize their own training course. China Vetiver Network will continue to encourage more local government to organize such trainings to speed up the dissemination of VHT and VS in China.

To congratulate the great success of a series of VHT training courses and to encourage more Chinese people involving in VHT actively in order to bring farmers more profit in addition to soil and water conservation, The Vetiver Network International released Vetiver Handicraft Awards to 4 outstanding Chinese farmers in 2009 who did excellent job in VHT extension (Table 3, Photo 1, Photo 2).

**Table 2 Awardees of the training courses**

<b>Number of training</b>	<b>Award Category</b>	<b>Awardees</b>	<b>Product for awarding</b>
No.1	1 <sup>st</sup> Award	Wu Songlian	Hat
	2 <sup>nd</sup> Awards	Hou Shizhen	Hand bag
		Zhong Bizhen	Basket
	3 <sup>rd</sup> Awards	Shi Xianzhou	Hat
		Shi Lingyan	Hat
		Hou Lianfen	Hat
No.2	non	non	non
No.3	1 <sup>st</sup> Award	Shi Lingyan	Basket
	2 <sup>nd</sup> Award	Wu Songlian	Hat
		Hou Shizhen	Bag
	3 <sup>rd</sup> Award	Shi Xianzhou	Vase
		Zeng Chunhua	Box
		Hou Lianfen	Bag
No.4	1 <sup>st</sup> Award	Liu Dan	Small bag
	2 <sup>nd</sup> Award	Li Yunping	Basket
		Wang Shiyan	Flower basket
	3 <sup>rd</sup> Award	Wang Peilan	Bowl
		Wang Shiquan	Pen vase
		Wang Maofang	Basket
No.5	1 <sup>st</sup> Award	Wang Lingfang	Bag
	2 <sup>nd</sup> Award	Xu Lixia	Vase
		Liu Yonghong	Hat
		Zhou Shuwei	Basket
	3 <sup>rd</sup> Award	Liu Dongmei	Small bag
		Yan Taolin	Hat
		Wang Zhuanhong	Hat
		Zhou Yuzhi	Hand bag
	Cooperate Award	Wang Haixia	Fruit container
		Liu Yonghong	Mat
Liu Dongmei			
No.6	1 <sup>st</sup> Award	Yan Taolin	Hat
	2 <sup>nd</sup> Awards	Wang Duanhong	Hand bag
		Liu Dongmei	Cap
	3 <sup>rd</sup> Awards	Wang Chaohong	Fruit container (ellipse)
		Wang Haixia	Fruit container (6 angles)
		Huang Hefang	Hand bag
		Chen Qingxiao	Basket

### **3.2 Reduce plastic pollution through farmers own use of vetiver handicraft products**

Before the products entering market there is high demand for farmers' own applications because China government issued the limitation for the applications of plastic products while vetiver handicrafts are the best substitute to replace plastic articles. The

production of such items need no costs and what they need to do is just to plant vetiver and make handicrafts at their own homes.

It is an urgent task for participants to extend VHT to their relatives, neighbors, and bordering villages. Once the handicraft is extended the use of plastics will be reduced dramatically in the villages. The extension will play an important role in rural environmental protection in the large mountain area. Therefore the importance of vetiver handicraft training and extension can not be overemphasized.

### 3.3 VHT bring farmers a colorful life

The VHT trainings helped female farmers make many different items, such as bags, baskets, containers, vase, benches, chairs, lamps, pillow, mat, animals (for fun) etc. for farming and for life. Many farmers exhibit their handicrafts at their own homes to express their achievements, capabilities and assuredness and to decorate their home to be more beautiful. Some farmers establish vetiver hedges around their houses to improve environment. Meanwhile the local authorities, required participant to contribute handicrafts for exhibition purpose in public.

**Table 3 Awardees from TVNI and their contributions**

Awardees	Type of awards	Contributions
Mr. Bi Weijun	Technical excellence	-- Training course organization; -- Model design and production; -- Team leader of trainers for Guangxi and Anhui Province, 2009
Ms. Shi Lingyan	Technical excellence	-- 2 <sup>nd</sup> award in 2007, -- 1 <sup>st</sup> award of 1 <sup>st</sup> training in 2009 in Guangxi; -- Trainer for VHT training in April 2009 organized by local authorities; -- Trainer for 2 <sup>nd</sup> training in 2009 in Guangxi
Ms. Wu Songlian	Vetiver handicraft	-- 1 <sup>st</sup> award in 2007, -- 2 <sup>nd</sup> award during 1 <sup>st</sup> training in 2009 in Guangxi
Mr. Shi Xianzhou	Vetiver handicraft	-- 3 <sup>rd</sup> award in 2007; -- 3 <sup>rd</sup> award during 1 <sup>st</sup> training 2009 in Guangxi -- Trainer for Anhui Province, 2009



**Photo 1 Technical Excellence Award receivers**

**Photo 2 Vetiver Handicraft Award receivers**



After the trainings, many women started to use vetiver bags and baskets for farming and shopping, while their children use vetiver bags to go to schools. They not only use the handicrafts, but also enjoy their products exhibited as arts.

### **3.4 VHT enhances women's social and economic position**

Vetiver handicraft trainings organized in the past years indicated that women are particularly fond of learning and producing vetiver handicrafts. Once they grasp the skills they do not want to abandon.

VHT training and following up activities provide a good opportunity for female farmers for exchanging technical and social opinions and ideas, to establish frequent contacts and enhance friendship which will promote community understanding and cooperation. In some places women established their own organization after the training called Vetiver Handicraft Cooperation Community that enhanced women's social and economic position.

The former experiences showed that the trained participants are fond of extending VHT to their relatives, neighbors, and bordering villagers. Such impact to the whole mountain regions will be far more significant than expected and will generate long term effect in the mountains, perhaps for several generations.

In the recent decades following national economic reform many farmers go to city to find job and leave their children at home, which caused social problem. VHT can attract farmers, female farmers in particular, back home to take care of their families at the same time to produce vetiver handicrafts to get profit.

### **3.5 The marketing of vetiver handicraft products**

Through investigation to local tourism market, evaluation to the products, the followings should be taken in consideration before the handicrafts can really enter market:

- ✧ Quality control should be a top issue to be considered. Each procedural should be carefully managed for example the age of leaves should not be over 3 months when cutting, the leave edges should clear out completely, the leaves should be heated in boiled water for 3 minutes and then dried completely in order to prevent mildewing and rotting.
- ✧ Products should be updated from time to time. New simple products should be put on priority position and designed based on extensive investigation to the tourism market. New awards will be designed for those whose new products has high potential in the market in order to encourage farmers to design more and better products.

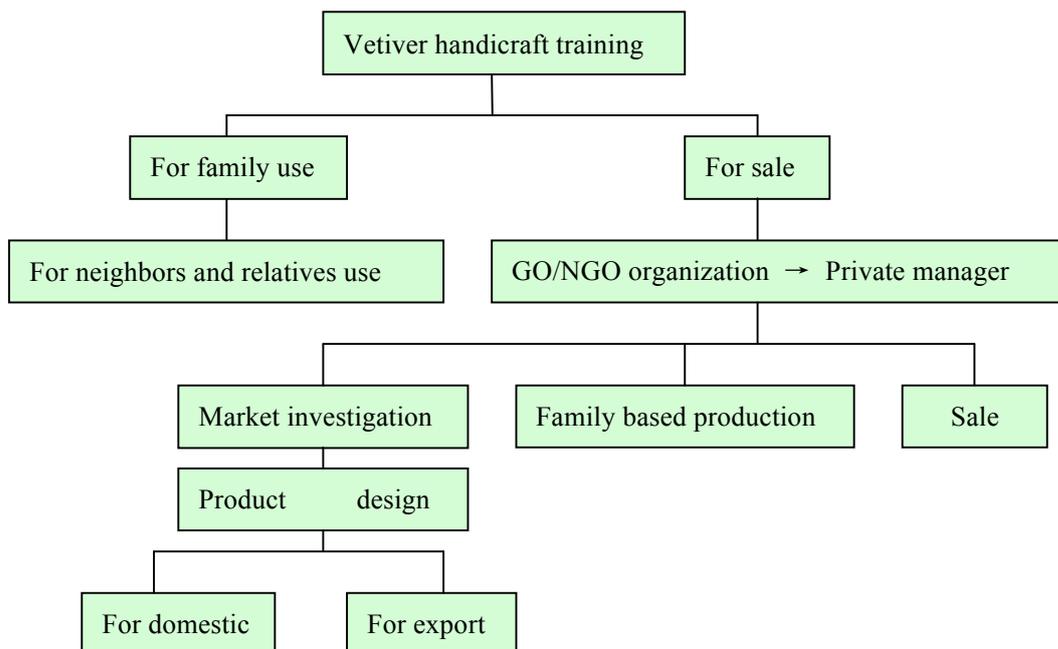
✧ Farmers should be encouraged to be private managers to organize participants to produce high quality products in batch and send them to the markets. Neither government nor NGO can direct the whole process from design to production to marketing. The burden of marketing should shift onto business agencies acted by Business Farmers. What both GO and NGO can do is to promote the appearance of Business Farmers (Fig.1).

During the training course participants should learn all of the procedurals of VHT to make relatively complicated products in order that they can design new products based on different needs. There are different demands between domestic markets and export markets. For export market, the products should be bigger and more delicacy and the price can be much higher. However, for domestic markets the products can be smaller and simple with low price so that farmers can get profit through large quantity production.

General speaking, vetiver handicraft production and marketing can be divided into several steps:

- ✧ for farmers' own use;
- ✧ for roadside-market in their own village;
- ✧ for nearby tourism plots;
- ✧ for domestic tourism market;
- ✧ for exporting to developed countries.

To help farmers open their market, the existing export agencies were contacted and vetiver handicraft products were exhibited during Canton Fair in 2010, which provided a channel for export.



**Fig. 1 Vetiver handicraft products marketing**

### **3.6 Put soil erosion control at top position**

Soil erosion control should be emphasized through out the trainings. Several measures were taken before, during, or after each training course:

- ◆ The distribution of different publications;
- ◆ The exhibition of posters;
- ◆ Establishing and visitation of planting demonstrations for different use of vetiver grass, such as for erosion control, slope stabilization, economic tree production, livestock-raising, pond sediments control, etc.

One decade's experience in China showed that vetiver based agroforestry projects can help farmers cultivate economic trees, raise animals, produce vetiver handicrafts and meanwhile control soil erosion and therefore are welcomed by farmers (Xu, 2003a; 2009).

#### 4 CONCLUSIONS

Vetiver grass can play an important role in soil erosion control, land rehabilitation, earth work protection and waste water purification. Most of these applications are based on the function of its massive root system, while VHT can use vetiver biomass above ground effectively. VHT can not only help farmers earn direct profit from vetiver leaves but also improve women's economic and social position. In addition, the dissemination of VHT can promote farmers to use vetiver handicrafts to replace plastic products and therefore to reduce plastic application and pollution, and protect rural environment.

VHT training courses are the best and most effective way to disseminate VHT. There will be more training courses to be organized in the near future in China, in order that thousand of Chinese farmers, women in particular, can grasp VHT. In addition, multiple publications were produced and widely distributed through out the country to disseminate VS and VHT more widely.

It should be emphasized that in any cases the role of vetiver for erosion control can not be ignored. Additionally, since four mature vetiver plants would sequester the same amount of atmospheric carbon as one fast growing poplar tree, vetiver planting will contribute to carbon sequestering and relief climate change dramatically (Grimshaw\*, 2008).

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