

VETIVER IMPROVING LIVES OF IMPOVERISHED INDONESIAN SUBSISTENCE FARMING MOUNTAIN COMMUNITIES, LED BY CHILDREN

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ABSTRACT

The East Bali Poverty Project (EBPP) was established in 1998 in response to a plea for help from an isolated and impoverished community of 2,500 families in 15 villages on 5,000 hectares of inhospitable mountain slopes, denuded by Mount Agung's massive 1963 volcanic eruption. Cassava and corn, all they could grow on the steep and sandy slopes, was their staple, contributing to endemic malnutrition, iodine deficiency disorders and high child mortality. 75% illiteracy, lack of access to health centres, government schools and markets compounded their problems.

Sustainable solutions for this isolated region started with integrated education programmes for children, requested by illiterate parents so that they could learn from their children and improve their future.

Starting the first community school in 1999 on vetiver stabilised community donated 'waste-land' on volcanic-sand, EBPP introduced vetiver as the most sustainable solution for rehabilitating 20km of dirt roads, giving first time vehicular access for 1,500 families *and* steep farmland to grow nutritious alternatives to cassava and corn crops to address the malnutrition problems.

Since 1999, over 500 EBPP school children in five schools have learnt how to stabilise terraces on steep mountain slopes for organic school vegetable gardens as well as all properties and benefits of vetiver, as part of their curriculum. Vetiver soon became the topic of choice in creative art classes, painting, handicrafts and roof thatching competitions.

After EBPP children and parents disseminated vetiver information throughout the whole village, hundreds of cassava farmers wanted to improve massive tracts of almost barren farmland, starting with vetiver stabilised terraces. Community organic vegetable 'learning' gardens followed, leading to individual kitchen gardens to provide family nutrition, combined with sustainable organic worm farms, seed-saving and rainwater harvesting for watering in the dry season.

Vetiver's bio-engineering properties stabilising dirt roads, soon encouraged hundreds of steep-hillside farmers to protect their homes with vetiver, with the added advantage of beautifying their dry environments, as vetiver stays green in the dry season when all other vegetation has shrivelled and turned brown.

Ancestral remedies of remedial facial scrub have also been revived in many villages with vetiver roots as the base and "nice smell".

EBPP's vetiver team of previously uneducated youths from six villages are now training children, youths and farmers in other disadvantaged villages. By the end of 2005, vetiver has helped thousands of impoverished farmers in different regions of Indonesia to conserve soil and water, even on rice terraces, and, in combination with organic fertiliser and seed-saving knowledge, develop sustainable vegetable and cash crop farming and look to a future of self-reliant sustainable social and economic development.

The success of Vetiver intervention in improving lives of these impoverished communities is illustrated in the educational art story book published in September 2005, entitled "The Art of Learning by Doing", showing the growth and development of children, barren land and communities.

Keywords: Poverty, community, mountain, vetiver, children, malnutrition, sustainable development, organic, vegetable, future, Bali

1. INTRODUCTION

This paper introduces Ekoturin Foundation “East Bali Poverty Project’s” (EBPP) sensitive community-based approach towards poverty elimination for isolated and impoverished mountain regions. The key priority for the communities was educating illiterate children as requested by their communities, giving these primarily malnourished children sufficient nutrition to strengthen and motivate them to learn, primary health care for all – prioritizing the needs of mothers and babies to ensure a healthier *next generation*, and safe water supply - with the ultimate goal of community self-reliance and sustainable social and economic development.

All programmes are initiated as models, designed to be replicated, not only in Indonesian mountain villages, but in any other deprived region.

Vetiver (*vetiveria zizanioides*) systems became one of the many indispensably necessary elements in EBPP’s comprehensive, holistic and integrated approach towards model sustainable social and economic development programmes for one of the most impoverished regions in Indonesia.

Vetiver was not funded as a specific project nor was vetiver regarded as an exclusive solution.

Problems were called challenges that needed solutions. Illiterate children eventually became the teachers of parents.

Their mountain location was the key challenge needing solutions - to make it more accessible and hospitable to allow a sustainable future to be initiated for the future generations.

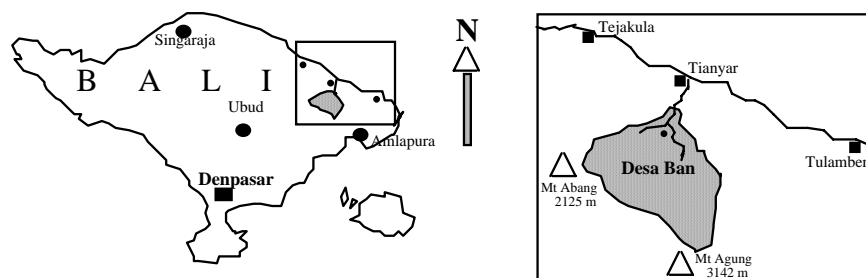


Fig. 1 Map of Bali showing Desa Ban (Ban Village)

1.1 Nutrition Problems Facing Communities with no Arable Farmland

Indonesia has a population of over 220 million people spread across 17,000 islands with some of the richest flora, fauna, marine life and mineral resources on the planet. However, alongside these abundant natural resources, a significant proportion of the population live in abject poverty, many in mountainous rural regions, subsisting on staple diets of cassava and corn, all they can grow on steep, dry and sandy slopes that have no topsoil, and hence no opportunity to grow more nutritious crops. Mountain isolation, often with no communication outside of their village, many subsisted the only way they knew: as their ancestors did.

Their life depends on their land for food, income and survival of present and future generations. Their sandy and constantly eroding mountain land supports little more than corn and cassava, their staple diet. Cassava though is a goitrogenic, and when it is the staple, blocks iodine absorption to the body, the most essential mineral for brain and body development. The lack of dietary iodine can result in serious iodine deficiency disorders (IDD), “the most preventable cause of mental retardation and brain damage in the world” (International Council for the Control of Iodine Deficiency Disorders).

Iodized salt is the recommended alternative when dietary iodine is not available from fish and vegetables, but unfortunately iodised salt is not readily available in most rural areas of Indonesia, where only locally farmed sea salt is sold, which does not contain iodine.



Fig. 2

A prevalence study of iodine deficiency in Indonesia in 1997-1998 through a joint program from the Government Health Department and Denpasar's Udayana University revealed *Desa Ban* (Ban village) as the most endemic iodine deficient village in Indonesia, with 84.5% of school children testing positive for palpable goitre. (Put one of Indraguna's cretin photos here and include in the presentation).

Overt cretinism was also documented by Ekoturin Foundation's East Bali Poverty Project volunteer health advisors in June 1999 in several of the most remote sub-villages. But this was probably only the tip of the iceberg of the effects of iodine deficiency which can also cause reproductive failure, increased child mortality and mental retardation.

Overt cretinism was also documented by Ekoturin Foundation's East Bali Poverty Project volunteer health advisors in June 1999 in several

1.2 Challenges and new Development Solutions for the Mountain Populations of Desa Ban

Desa Ban was identified by EBPP's founders in April 1998 (prior to the IDD study being published) as one of the most isolated and disadvantaged regions in Indonesia. 2,500 families lived in 19 sub-villages scattered over 7,200 hectares of the east and north-eastern slopes of Bali's two highest - and most sacred - mountains, Agung and Abang, from 200-1,200 metres above sea level. With no roads, rivers or electricity, they were literally cut off from the outside world with little choice or chance to change.



Fig. 3

After EBPP's participatory interviews with 1,056 families in 1998 and 2000 identified the key problems and barriers to progress in this isolated region, shown in the left column of Table 1, the communities had to choose their priority if they wanted us to help, knowing our promises of no money, rice or other type of 'hand-out'. The communities in the 8 most isolated communities chose wisely: "Education for our children so that they can lead us to a better future".

After initiating the first integrated education programme in Bunga hamlet for 30 children, and seeing the high community motivation,

small funding was found to open the key access road with two parallel concrete strips and vetiver stabilised verges to enable the whole population of the village to travel to markets and health

centres via the saddle between the two mountains. This was the start of change in this whole mountain village where every family, without exception, in 1998 did not believe life could ever change from the life they knew, a continuous daily struggle, with high child mortality and every day being the same as any other.

Table 1: Community problems and barriers to progress in 1998 and Improvements by 2005

No	Main Community Problems in 1998	Sustainable changes by 2005, with Vetiver as the direct or indirect key
1	Highway infrastructure & public transport: No asphalt roads, only steep, sandy and highly erosive mountain tracks, averaging one metre width. Very few owned motor cycles. 90% had never left the village. They could not get to hospitals or markets with good food supplies;	Over 20km of vetiver-protected dirt roads improved, many with concrete tracks: a 10km spine road through the village linking all hamlets and allowing 2,500 families to leave the village, and 10km to the four previously totally cut-off communities. Trucks, pick-ups and motor cycles can now safely transport people, cattle vegetables, corn & cassava to market – and mothers can take babies to health clinics.
2	Illiteracy: virtually all parents and almost 2,000 children illiterate due to no accessible schools or money to pay school costs;	More than 600 children have been educated in EBPP's schools since 1999, passing on the relevant education to their parents
3	Diet not adequate: The staple for most is cassava, sometimes mixed with corn and/or a little rice. Meat or fish were rarely in their diet. Diet lacks vitamins, minerals, protein and iodine;	Nutritious vegetables are now available daily from vetiver-enabled school, community and individual kitchen gardens as well as from the now accessible markets in and outside the village.
4	Malnutrition & micronutrient deficiency: Up to 50% of infants malnourished; many children and adults had stunted growth.	Malnourishment of infants & children virtually eliminated through (a) nutritious school meals for children attending EBPP's schools, (b) iodine and vitamin A supplements provided annually by EBPP to all children and (c) nutritional supplements provided to all 1,400 infants in EBPP initiated <i>Posyandu</i> (mother/baby monthly health posts).
5	Child mortality: 25% before one year old (EBPP survey 2000-2001);	Only 2 infants have died in the last 2 years from a total of 1,400.
6	Iodine Deficiency Disorders (IDD): Palpable goitre in children aged 6-12: 84.5% shown by 1998 Government Health Department survey (see above)	Only 20% of children had palpable goitre in August 2005 in Government Health Department survey– much lower than the national average.
7	Water supply: NONE. Either a 2-3 hour walk to get water from the few remote wells or springs, most of which were highly contaminated with E-coli bacteria, or from household rainwater storage vats, open to the elements and equally contaminated. A high percentage of child mortality result from consuming contaminated water.	Over 1,300 families now have safe water supply from remote springs piped to central community reservoirs, & over 300 household rainwater storage reservoirs covered with concrete, with water filters and hand pumps. E-coli bacteria count in these cases is now zero.
8	No Local Health facilities: the average walking time to the <i>Puskesmas</i>	Thanks to improved access roads facilitated by vetiver, EBPP established 21 <i>Posyandu</i>

	(community health centre) is 3-4 hours; most of the sick never go because of the dangerously steep and narrow dirt-tracks. The nearest hospital was 45km away;	(mothers & babies health post) in each hamlet in 2003 manned by locally trained cadres. Over 1,000 mothers and 1,400 infants attend and get all vaccinations, nutrition status checks, nutrition supplements etc.
9	Village market - No iodised salt or nutritious vegetables sold: 3-4 hours one-way walk (no public transport or motor cycle) to the only market at the bottom of the mountain - held every 3rd day from midnight till 8am;	All of the 2,500 families now go more regularly to their village market and to larger and better stocked markets outside the village to stock up with vegetables, fish, iodised salt etc. on the vetiver stabilised all-weather tracks to their hamlets. Pick-ups and motor cycles, fully laden with vegetables, fruit and other supplies are now a daily site throughout the whole village – where no vehicles ever travelled before.

The right hand column of Table 1 shows the transformation of all of the restrictive “poverty factors” that prevented progress before 1999. The most common causes for their impoverished past were clear to see: lack of access to all basic facilities such as health, schools and good markets; lack of knowledge of and access to essential nutrition, especially for children and the inability to grow nutritious vegetables on their land; lack of communication with the outside world and hence not knowing their lives could be better; no access to safe water sources nor treatment for babies with water-borne sicknesses.

The following sections summarise EBPP’s participatory community-based approach to the above problems, highlighting the key role played by vetiver systems in addressing poverty elimination by opening doors to the communities to plan their own futures of self-reliance, healthy families and sustainable social and economic development, led mainly by their children.

2 VETIVER FACILITATING ESSENTIAL COMMUNITY INFRASTRUCTURE

2.1 Community Based Participatory Approach

Successful solutions initiated since 1999 in Desa Ban can be attributed mainly to the fact that all of EBPP field staff since the beginning are natives of the village, speak the local Balinese language and could empathise with the most isolated communities as they also faced the same problems. Hence this was a 100% community based programme: for the people, by the people.

With a target to initiate integrated and sustainable solutions to all of the key problems facing the communities, EBPP field team held daily dialogue with village elders, parents, farmers and even children to understand the perceptions and beliefs held by those in the higher mountain regions with the highest child mortality.

Vetiver, entering the lives of this extremely isolated and impoverished region of mountainous east Bali in 2000, was rapidly embraced by the population of over 2,500 families in 19 sub-villages as a multi-beneficial solution for many barriers to their development as documented in the 2003 paper “Vetiver Grass: A Key to Sustainable Development on Bali” (Booth, Adinata). It is only really in the last 2 years that the true effects of sustainable social and economic community developments are being clearly seen.

Starting with a simple school in 1999 with a relevant and integrated curriculum and a stabilised access track opened in March 2000, a better future was in sight for many.

2.2 Vetiver Protected New Roads Open-up Thousands of Lives to Look to The Future

It was clear from the outset that this large community of over 2,500 families had little perception of anything outside their past beliefs. EBPP's initial reconnaissance of the whole village showed no highways, only narrow dirt tracks used by thousands to walk their cows - their life investment and savings - for up to 12 kilometres and wait for a pick-up to come to the saddle between Mounts Agung and Abang from the southern village. They then entrusted their cattle to a 'broker' to sell at the distant west Bali market, knowing they would get about 60% of the sale price. Better than nothing!

Vetiver, first introduced in 2000 to stabilize newly widened steep dirt roads to enable the whole population of 2,500 families to leave their village for the first time ever by vehicle, instead of on foot, has not only ensured that people now have access to markets and health centres, but has also inspired many communities to buy communal pick-up since early 2003. Every day now, one or both of the pickups from Cegi and Pengalusan hamlets are seen either coming back from market fully laden with vegetables, fruit and domestic goods or taking cattle to the main Bali cattle market 100 kilometres to the west.

Many other visible signs of sustainable economic development in all of the 19 communities, re-investing the income they can now get from better cattle and crop prices, include:

- Trucks bringing building materials, to the previously most isolated hamlets that only had bamboo huts before, for building new 2-3 roomed houses, with ceramic tiled floors, sofa sets and proper tiled roofs;
- New motor cycles plying the safer and more accessible tracks;
- New Balinese temples with high quality places of worship, proudly adorned for new ceremonies where simple bamboo temples stood before;
- Young and old people alike venturing to the world outside their village for the first time, and being inspired to improve their lives with ever increasing knowledge;
- Husbands taking their wives to hospitals and clinics to have their babies with professional help, instead of in their bamboo hut alone, when no midwives could access the village;
- Government Health Department staff visiting the sick when needed and attending all monthly Posyandu.

This new empowerment has given every family a vision for their future, thanks to just one access road, kept open through the most treacherous storms and flash floods, due to the power of vetiver roots.

2.3 Vetiver Stabilises Built-up Volcanic Sand for School Construction

All of EBPP's integrated education programmes started in the small community *bale banjar* (meeting centre) in the respective hamlets as soon as we had donors committed to covering the children's education costs. These were not very conducive to the children learning due to being open sided buildings and often needed for community meetings or religious ceremonies, thus disrupting classes.

As soon as we had funding to build a simple school, which we actually call "community learning and development centres", the community had to allocate land to accommodate the average 150 square metre schools as well as recreation areas next to the school. The problem was that none of the communities had any level land large enough. In each case, land had to be built out from small hills and here was where vetiver provided the bio-engineering solution to stabilise the compacted sand perimeters.

The most difficult location was the land for Cegi School – all we had was a rounded hill forming the access track leading to the children's school vegetable garden, which was the most powerful vetiver example in the whole region: a vetiver-terraced vegetable garden initiated on a 60 degree slope that now produces the best vegetable harvests in the whole village. This location had been discounted by the community and even many of EBPP field team, as the whole foundation would comprise volcanic sand cut from the top of the hill to fill the area until the size needed was

achieved. The power of vetiver, taking firm root within days surprised everybody – and sent a message through the whole village that any sandy ground can be stabilised with vetiver.

The school was completed in July 2004 and now delights everyone with the permanent green carpet of vetiver surrounding the whole building, and the preventing any erosion, to the extent that any blown debris of plastic or paper is trapped by the vetiver, keeping the surrounding hill-slopes very clean and attractive.

2.4 Mountain Homes Made Safer and Greener with Vetiver

Most families start life in a small single roomed house built from woven bamboo with a dirt floor, on a piece of land cut into their sloping hillside land. The plots are made quite large to allow for continuing erosion, generally protecting the perimeters with either elephant grass or caliantra trees, watching each rainy season as the erosion washes the sand from under the roots of both of these unsatisfactory solutions. Life changed for hundreds of children and their families once they took vetiver home to plant around their buildings. Ask any child what they like most about vetiver and, apart from the benefits in establishing organic vegetable gardens, all will talk about how vetiver has improved their home life by stabilising the land, beautifying the surrounds during the hot dry season when all other grass shrivels and dies, but most of all, how the *akar wangi* (fragrant roots) give a nice “perfume” to their home.

3 ORGANIC VEGETABLE GARDENS AND VETIVER NURSERIES PROLIFERATE

3.1 Diets Improve as Organic Vegetable Gardens Grow near Kitchens

Diets have significantly changed since hundreds of families learnt about the many vegetables that could grow on steep mountain slopes that could only host cassava and corn before. These families have also learnt the dangers of too much cassava, not enough iodised salt and the lack of vitamins and minerals in their diet.

Fresh vegetables are now eaten daily by over 500 families that only 5 years ago had never even seen a carrot, tomato or a potato. If none are available from their garden, they go to the distant markets in their new pickup trucks or on motor cycles to ensure that the family is well fed.

Starting with children’s school gardens, all initiated on steep plots of land provided by the respective communities, parents took a great interest and since 2001, more than 500 children have learnt the rudiments of organic vegetable farming, many taking seedlings to their own steep land to try. The community learning gardens, piloted in 2003 have now reached the stage of farmers starting their own kitchen gardens, supported by EBPP and working in small teams. The key to success here is not only vetiver, as that is the first step, with each of the farmers getting enough vetiver slips towards the end of the 2004-5 rainy season to plant in prepared terraces, in preparation for the onset of rains in December 2005. At the time of writing this paper, many kitchen gardens are ready in all four hamlets for sowing the first vegetable seeds for their future land improvement.

3.2 Community Vetiver Nurseries

The first community Vetiver nurseries were established in 2002 in four separate hamlets, two on Mount Agung and two on Mount Abang at elevations around 1,100 metres above sea level. Local unemployed young men became the guardians of the nurseries, with a brief to tell everybody in their communities of the benefits and for all of the farmers to see for themselves. In conjunction with EBPP schools in all of these hamlets, vetiver was soon “disappearing” from the nurseries to start trial gardens, stabilise homes and, in many cases, to eventually get enough vetiver roots to introduce the root perfume to their smoke filled, single roomed homes.

Since 2003, more than one million vetiver slips have been transplanted to community learning gardens, expanding school gardens and family kitchen gardens.

4. VETIVER PREVENTS DESTRUCTION OF ESSENTIAL MOUNTAIN SPRINGS

A remote mountain spring that EBPP had developed in 2003, providing almost 100,000 litres of water per day, the only safe water source for over 500 families in the hamlets below, was almost destroyed when raging flood waters gushed down the mountain and completely ripped out the side-slopes supporting the water channel in February 2004. This was only the second full rainy season since completing the spring and not only was the daily rainfall more than previous years but the flood waters were made worse by additional runoff from a new asphalt road recently built higher up the slopes. This was to be a serious test for the bio-engineering properties of vetiver.

A major concern when planning the rehabilitation with vetiver during the dry season was that the roots may veer towards the spring in search of water during the dry season. To protect against this, the land was completely excavated at both sides of the 25 metre long concrete water channel to a depth of one metre and lined with plastic sheeting before backfilling. Both side banks of the spring channel were then reshaped to provide a stepped effect to further reduce the water flow velocity and over 10,000 vetiver slips planted in rows, ziz-zag pattern 20 cm apart with slips at 10cm spacing along the rows. The vetiver was watered daily for the first month by the local people, who by now were becoming experts with vetiver and ensured they kept their young vetiver shoots clear of any competing weeds. Within 2 months, the vetiver was a rich green carpet, with roots extending down much more than a metre.

The most important additional protective measure was to clear undergrowth from the steep mountain slopes above the spring and to guard against future torrents threatening the spring. Vetiver was planted in the steep valley above the spring but in diagonal lines to divert the flood waters towards a natural channel to the rear and west of the spring box that had formed after our vetiver protective diversionary works a year earlier.

Vetiver worked its miracle. After an even heavier and longer rainy season from November 2004 to May 2005 and many monsoon floods during the year, the mountain spring is very much intact, looking like a lush vetiver nursery. Regular tests with our Delagua (portable laboratory designed by and purchased through Oxfam UK) verify that no contamination has leached into the channel, proven by a zero count for deadly E-coli bacteria. This delicious safe spring water is literally saving many babies lives every year, evidenced by the now zero child mortality rates.

5 VETIVER IN CHILDREN'S ART AND "THE ART OF LEARNING BY DOING", THE BOOK OF THEIR LIVES

The power of vetiver penetrated all of EBPP's school children from the time they saw how different vetiver was to their elephant grass, 'bluu' and caliantra tree roots in completely holding the sandy slopes, enabling them to grow so many types of vegetables in steep school gardens and at home. It was no surprise therefore when all of the children started featuring vetiver terraces and borders on all of their landscape and home-life drawings in their creative art classes.

EBPP published a book in September 2005 entitled "The Art of Learning by Doing" which tells the story of their lives from before starting school until graduating primary school, fully illustrated with 105 children's paintings. The book was completely inspired by the quality of our children's art. In 2003, we realised that they were not "just drawing", they were illustrating every aspect of their new lease on life: improved health and hygiene, carrying water from their new mountain spring-fed reservoirs, building their own school, bathing with soap -something they had never heard of before, but most important, illustrating their very successful vegetable gardens with vetiver as an integral element.

The book is divided into 7 chapters yet the one that inspires children and adults most is Chapter 4: "Farming Worms and Vegetables". The chapter describes in graphic detail how an organic vegetable garden can be created on steep and barren land, with vetiver as the first step. It

goes on to explain the process of establishing a worm farm for a sustainable organic fertiliser supply and even to harvesting the vegetables and seed-saving.

The book was designed to be a resource for children, teachers and parents the world over and we are presently in the process of developing a teacher's guide to help other children, especially in lesser developed countries, to learn with the book, through East Bali Poverty Project philosophy of "see by example and learn by dong". The book can be ordered directly from EBPP.

6 VETIVER TRAINING FOR THE PEOPLE BY THE PEOPLE

6.1 Vetiver Training Video

Sensitively designed awareness, education and training programmes piloted initially with children in EBPP's five schools, have been the cornerstone of success in all of our sustainable development programmes, vetiver systems forming one of the main foundations for the future. We continuously strive to make more information available to share with other disadvantaged regions, schoolchildren and farming communities. We are very proud that to complement our field training, internet information, Newsletters and local media vetiver information that we now have an easy to understand Vetiver Training Video, which is presently in both English and Indonesian. With a running time of 30 minutes, the video gives many examples of EBPP vetiver programmes in the village, in the vegetable gardens and a very clear explanation by Ardika of preparation and planting techniques as well as descriptions by the Desa Ban village Head, Mr Ketut Karta, of the benefits vetiver has brought to his village (see below). Filmed and produced by UK-based Sarah Matthews and The Brock Initiative, Sarah is trying to get funding to produce the training video in different languages so that it can help a much more international audience.

6.2 Vetiver Field Training by EBPP Team

An important aspect of any sustainable community development programme is the total participation of the host community in the knowledge that they have ownership of all of the projects executed in partnership with them for their benefit. All of EBPP field team are natives of the village, many of whom had never had a school education, yet are all now proficient in many skills. Vetiver is no exception.

EBPP vetiver team, led by Ardika Adinata, comprises thirteen people, all natives of the village: two assistants, Nyoman Budiantara and Nyoman Widiassa who have both been with EBPP for 5 years and two young men from each of the five hamlets where EBPP has community schools and organic vegetable garden programmes. The youths from the five hamlets are responsible for ensuring the vetiver nurseries in each hamlet are maintained in good condition, that all school and community gardens have sufficient vetiver and that all of EBPP schools have a ready supply of vetiver roots and dried grass for handicraft classes. Using Suzuki Trail bikes, both Nyoman's are constantly monitoring, training and working with the local farmers and children to ensure that vetiver benefits are optimised.

6.3 Training Farmers in other villages to use Vetiver and Organic Fertilisers

A key role for all in EBPP vetiver team is continuous training of others, not only in the village but also to farmers groups in other villages. Ardika has become quite an expert in training everybody from young children to the oldest and most traditional farmers, especially those from similar mountain regions to our village, engaging the learners in dialogue to ensure they fully understand how vetiver can benefit their lives and how to combine vetiver as an integral part of sustainable organic vegetable farming development.

6.4 “Life Skills” Training Programme for Lake Batur Farmers

In a recent initiative, EBPP teamed up with the newly formed “Bali Organic Association” (BOA) to provide ‘life skills’ training to farmers groups in marginal regions, especially lake shores, where not only is the lake water suffering heavy pollution from chemical pesticides washed into the lake, but also from the soil erosion and general garbage that finds its way into the water. Dr Ni Luh Kartini, one of Indonesia’s foremost experts in organic worm castings development, a key advisor to EBPP since 2000 and the founder of BOA, held the first farmers training workshop for the farmers around Lake Batur crater, Bali’s largest and most important lake, in December 2005. Ardika was a keynote speaker on Vetiver, where once again, the comprehensive A2-size Vetiver Posters, provided by the Vetiver Network, provided a great visual aid, showing the many examples of vetiver uses around the world. The other keynote speaker was EBPP’s Rosmara Dewi who leads our organic vegetable farming team, relating the development and successes of the organic vegetable and school gardens in Desa Ban with the most isolated farmers in Bali - made possible by the unique properties of vetiver in containing the level terraces on the steep and sandy slopes.

6.5 Vetiver to Prevent Lake Water Pollution

The key reason for holding the first ‘life skills’ training workshop on Lake Batur shore was to explain to the farmers that they are destroying their own future by polluting the lake, especially from chemical fertilisers and pesticides, not only from surface runoff but also from the vast quantities that have percolated through the soil over the years and entered the lake from below. Extensive land erosion from cutting down trees for fuel and bamboo for Balinese ceremonial needs has further exacerbated the problems.

Hence, in addition to convincing the farmers to start using vetiver and organic fertilisers to conserve their valuable soil and water on their farms, proposals are presently being prepared for planting vetiver around the complete lake perimeter to provide sustainable future protection.

6.6 Farmers Questions and Answers about Vetiver

The Question and Answer session following the training was very rewarding, as these extracts show:

Farmer Q: Apart from controlling erosion and conserving soil, can the grass be fed to my cows? I worry because the roots have a perfume smell and you say that the roots can also absorb nutrients and bad chemicals.

Ardika A: The roots have their own process which does not affect the quality or taste of the grass, which is certainly good for your cows.

Q: Now we see Vetiver, it looks the same as a grass we have been using for many years called ‘Apit Grass’ that we use as a skin remedy for babies and adults to cool and soften the skin. Is it the same?

A: Yes, it is the same. In fact we only found out recently that in our village also many families have used ‘apit’ for generations – even my own mother, and even though I have been in charge of EBPP vetiver programme for 5 years, I never knew that it was akar wangi she was using when she made the scrub for my twin baby sisters – because she also only knew it by the name ‘apit’!

Q: Can we plant vetiver at any time of year, whether wet or dry season?

A: It is better to plant in the rainy season to ensure that there is plenty of water for the vetiver to grow. If you plant in the dry season, make sure you water it every evening for at least the first month, and maintain continuously for the first 2 months to prevent weeds growing and disturbing vetiver growth.

7 CONCLUSION: VETIVER BECOMES AN INTEGRAL PART OF COMMUNITY LIFE

Five years since first introducing vetiver systems to the communities of Desa Ban, the most impoverished and isolated village in Bali, as an integral element of a model programme, we decided to find out from a cross section of the whole community of 2,500 families what their general perception was of vetiver and what they used it for. Ardika and EBPP Vetiver Team interviewed many community leaders, farmers and children. Our biggest surprise was that hundreds of families have been using akar wangi (vetiver aromatic roots) for years without ever connecting it to the vetiver grass EBPP introduced for erosion control and soil/water conservation in 2000. More surprising was that Ardika's mother learnt the benefits of akar wangi in boreh (medicinal scrub) from her mother and grandmother and has been buying apit roots as long as she can remember, as well as selling them to other mothers in her small village store. The following two sections are very interesting.

7.1 BOREH: Medicinal Powder from Vetiver Roots (akar wangi)

Vetiver is known by much of Desa Ban community as Padang Apit (Apit grass), but until recently did not realize it was the “magic” grass that has been stabilizing dirt roads and facilitating thousands of organic vegetables in the school and community learning gardens. They have known it for many years as grass planted on two sides of their dirt tracks, and thus ‘flanks’ (“apit”) the track. They don't remember when or who introduced the grass to their village nor did they know the main function of grass for preventing erosion and conserving soil and water; they only planted it at the side of roads to make them more beautiful in their sandy and barren areas. Because the root smells (wangi) good, the community say they have used it since ancient times as a boreh (medicinal) powder for the babies, children, adults and the elderly.

Benefits of boreh:

People believe that the boreh from Vetiver will tighten the skin, strengthen the joints, freshen the skin, and make the body warm as well as being a body perfume. Traditionally, boreh is used mainly for infants and children. Adults use it when they have a fever or cold to make the body warm.

Ingredients: Dried Vetiver root, rice flour and water

How to make it:

Pound the vetiver roots till they become a powder; add the rice flour and mix with a little water until it becomes a soft paste and roll it into ‘balls’ the size of small cakes. Then dry them in the sun or the wind and store in a dry place. If there is too much humidity the boreh will lose its healing and refreshing properties.

How to use it:

Grind the dry boreh cakes to a powder, mix with water and then spread thinly on the face and body.

7.2 The Key Benefits of Vetiver in Desa Ban Community

Most of the communities now understand the main benefits of Vetiver from the roots to the leaves. The respondents below are people who have been involved with EBPP and vetiver since the beginning.

Mr. I Ketut Karta, Desa Ban Village Head – responsible for the whole population of 2,500 families in 19 sub-villages

Vetiver is very suitable & good to be developed in Ban village because the typical land in Ban is very steep and sandy. Every year there used to be many landslides, but not any more in the places where vetiver has been planted. Only Vetiver can solve the landslide problem because if we plant big trees the land will crack in strong winds and can result in a landslide. If we plant vetiver, the land will not crack even in very strong winds, which are daily in the dry season. Besides that, the cows like Vetiver grass very much. The leaf also can be used for roof thatching and we now use the roots for handicraft and room perfume.

Mr. I Nyoman Kantor, Pengalusan Sub-village Head

Vetiver has many benefits and since planting in our village has stopped erosion. The leaves and roots can be are used by our school children to make attractive handicrafts. Vetiver also makes the road look green and beautiful if we plant it at the side of the road.

I Nyoman Arta Jaya, EBPP's Bunga junior high school boy, since 1999

Vetiver is the best solution in our village to stop erosion. Since I planted vetiver on my family's farmland there has been no more erosion like before because the roots can hold the land. We use the leaves for thatching our house roof and as mulch on our agricultural land to reduce the evaporation. I especially like the aroma from the roots to be use as a room perfume and handicraft.

Ni Srijati, EBPP's Manikaji junior high school girl, since 2000

Vetiver has been very good for our village by stabilizing the land, preventing landslides like before and stopping soil erosion. When we plant it around the vegetables garden, Vetiver roots reduce the pests, contain the fertilizer, and the grass acts as a good windbreak to protect young vegetables. And the leaves provide good food for our livestock.

I Wayan Lias, EBPP's Cegi junior high school boy, since 2000

Vetiver is good to be developed in our village for erosion control, as handicraft, expel the pest in the vegetables plot and the root can be used for medicinal powder for the baby to make the skin fresh, strengthen bones and make the body warm if we feel cold.

REFERENCES