Payment for Environmental Services (PES) Feasibility Report for Better Management Practices (BMP) agricultural model for environmental services (ES) November 2009

By

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1. Introduction

The Indus for All Programme of WWF-Pakistan, hereafter referred to as the Programme, is designed as a six-year intervention intended to improve natural resource management (NRM) practices needed for conserving and restoring ecosystems of the Indus Ecoregion. The Indus eco- region has been declared as a priority region among the Global 200[1] owing to its ecological significance. Between 2006 and 2012 the Programme envisages interventions at Keti Bunder, Pai forest, Chotiari reservoir and Keenjhar Lake for fostering community based NRM practices which conserve and restore the regional ecosystem and improves their livelihood at the same time.

One of the interventions planned in this period is a Payment for Environmental Services (PES) scheme. The PES scheme requires a feasibility in the first instance, needed both to assess the possibility of additionality and reconciliation of buyer and seller interests. Thereafter a plan is needed before the scheme can be tested.

The PES chosen by the Programme in this case will highlight the need to halt the depletion of agricultural ecosystems in the Indus Ecoregion. This report is the evaluation or feasibility of a proposed PES for cotton growers of Chotiari, Sanghar District, who by adopting Better Management Practices (BMP) would provide an environmental service (ES).

External ES beneficiaries in this case are manufacturers in Pakistan's textiles sector who stand to gain from the onward sale of "green cotton". In return for the adoption of BMPs that will ensure agricultural ecosystem conservation and restoration, ES beneficiaries are expected to make direct, contractual and conditional payments to growers. The modalities associated with such payments are outlined in the PES plan.

The final terms of reference for the feasibility study of PES scheme which were agreed with the donors have the following objectives:

i. The feasibility should identify whether trade-offs exists between growing cotton in Chotiari and dedicating land to growth of better cotton, with mounting land-use pressures liable to degrade natural resource assets.

ii. It should also make clear that conflicting interests can in fact be reconciled through compensation.

iii. In addition, the feasibility should identify baselines to enable measurement of additionality.

2. Literature Review

The growing concern among the scientist and others regarding the depletion of ecosystem has ignited numerous conservation efforts. The debate has lead to

[1] The Global 200 ranks the earth's most biologically outstanding terrestrial, freshwater and marine ecosystems. This first of its kind comparative analysis covering all of the planet's habitat types identifies 238 Ecoregion of which 142 are terrestrial, 53 freshwater, and 43 marine. The analysis was jointly carried out in 1997 by the World Wide Fund for Nature (WWF) with support from such institutions as the National Geographic Society, the United Nations Environment Programme and Birdlife International (WWF-P, 2007).

quantifying the benefits of environmental services (ES) and evaluation of appropriate policy measures for the restoration and conservation of the ecosystem.

In this regard economists have suggested that markets are appropriate institutions for effective and efficient outcomes for the 'tradable goods' part of ecological services, but factors like time lags involved, the complex cause-effect relationships, incomplete and contested property rights lead to 'market failure' for ES provision in most if not all cases. *(Tomich et al. 2004a*).

ES provision tends to cover externalities in the private decision making process and usually involves 'lateral flows' that affect areas beyond the 'farm' scale (*van Noordwijk et al., 2004*). Market failure thus constrains the emergence of spontaneous sustainable and equitable solutions for land-use decisions and suggests that additional institutions will be needed.

The expectation that 'markets' for environmental services will provide solutions as such seems to ignore the underlying reasons for market failure. However, there is at least some potential for strengthening processes of voluntary engagement and adaptive learning with the outcome-based conditionality that markets provide, to achieve greater efficiency, effectiveness and sustainability (*Wunder 2005; 2006*).

A Payment for Ecosystem (PES) schemes is one such initiative which provides market-like solutions, where ES suppliers are rewarded by the buyers who are beneficiaries in return for a sustainable provision of these services. (*Wunder, 2005*) has defined a PES as a voluntary transaction where a well-defined ES (or a land-use likely to secure that service) is being 'bought' by an ES buyer (minimum one) from a (minimum one) ES provider if and only if the ES provider secures ES provision (conditionality).

PES should not be regarded as a single, rigid approach, but rather a group of related approaches that display one or both of two key characteristics. Firstly, those who are responsible for ensuring the provision of ecosystem services should receive payments or compensation to encourage future provision of the ecosystem service. Secondly, those who benefit from the ecosystem services should provide the revenue for the payments. Where the collection of this revenue is linked to a fee on the use of the ecosystem service – for example a fee on water use – this can also create incentives for the more efficient use of resources. As an example, the electricity company paying the upstream people to help stop the sediments in the water by growing trees on the edges of the watershed.

'Pure' PES schemes contain both of the above mentioned elements, as in the cases from Guatemala and Indonesia where industries with high water use are negotiating Payments with local communities to managed forests in order to preserve water quality (*WWF, 2005*).

However, while all PES schemes contain some element of payments to those who maintain environmental services, they do not all contain a reciprocal mechanism for generating revenues *directly* from those who are beneficiaries. In the case of Australia's Liverpool Plains, a mechanism was established for farmers to receive payments for undertaking conservation orientated land arrangements. In this case, the funds came from central government revenue (*WWF, 2005*).

PES schemes are mainly designed for conservation of biodiversity, watershed protection, carbon sequestration and maintaining landscapes in their original pristine condition; however, other schemes for sustainable agriculture have also been popularized in the recent past.

In many developing countries, largely due to adverse economic conditions or perverse market incentives, farmers have resorted to agricultural practices which may be beneficial in the short run but whose continuous implementation is harmful for the environment and eventually leads to the need to relocate farming activities to even more marginal lands. Examples of such agricultural practices are the excessive use of pesticide, fertilizer and wastage of water by flooding the field, etc.

Eco Conservation Initiative (ECI) and WWF Pakistan (2006) have underlined the need for adopting Better Management practices (BMP) for a sustainable agriculture in Pakistan. It has defined BMP as "an action which must maintain or increase crop returns while minimizing the impact on the environment". In addition to this, BMPs are practices used by agricultural producers to control the generation and delivery of pollutants from agricultural activities to water resources of the state and thereby promoting environment friendly practices.

All proposed PES schemes must be evaluated before their implementation. Wunder (2005) notes that one useful means of evaluating a PES scheme is by considering a hypothetical state that is with and without PES scheme scenario – i.e., the setting up of a baseline to consider what is known as "additionality"[2].

Samji and Sur (2006) observed that the baseline is actually fixing the time at the base; i.e. a benchmark from which one may measure the progress. It is a snapshot of all necessary or relevant variables at a given point in time which is mostly before the project/ program for improvement is implemented. The consultant has used the present practices of cotton growers to be the baseline for establishing additionality.

3. Methodology

Our feasibility methodology for BMP-type PES scheme for cotton growers of Chotiari, Sanghar District, Sindh province, relies on comparison of the profitability (PKR per acre, per annum) of alternative land uses. In this regard a field survey was conducted from 19-21 November 2009 at Chotiari to obtain the necessary information.

4. Target population and sampling plan

After extensive discussions at the WWF Karachi office, it was mutually agreed upon that the target population for the PES intervention shall be the 'Informed Group' which consist of all those large and small growers who have applied Best Management Practices (BMP) at two demo plots in that area. The demo plots were set up by the WWF-P in the year 2008 during the month of April. These demo plots are located at Chotiari and Din Suno Faqir Umrani villages. About fifty local growers from the same and surrounding villages participated in all the process of cotton

[2] Additionality refers to an increase in the desired scenario, for example an increase in the crop area under BMP from the present state of agriculture practices which are essentially non BMP.

production to actually experience the 'Green Cotton' initiative in the area. From the informed group in total twenty nine farmers volunteered to be interviewed.

5. Survey instrument

A questionnaire was developed for in person interviews to collect information from the cotton grower of the area (see Annex I). The questionnaire was filled by the consultant and his team members during visits to the area. The interviews were conducted inside CBO offices participating in WWF-P Indus for All Programmer's Farmer Field Schools (FFS). The survey was facilitated by the PIU team of the Sangar office and an agricultural extension officer (Agricultural Officer, Sanghar District) who has been spearheading the FFS initiative in the area.

Beside the survey, focus group meetings were also held to obtain information necessary to formulate recommendations for both the PES feasibility and plan. Moreover, expert opinion was sought to acquire the insight into the matter (see Annex II for the list of focus group and key informants interviewed).

6. Limitation of the study

The study was conducted with limited resources and absence of valuation estimates which are sometimes used for, but not essential in, assessing whether or not the proposed scheme is realistic. While the consultant and WWF-P have the capacity to conduct non-market net benefit analyses available resources did not permit us to conduct a valuation study.

It may, however, be noted that the Indus for All Programme conducted a total economic valuation (TEV) study of agricultural land at Pai, Shaheed Benazirabad District (formerly Nawabshah District)[3]. The raw data for the study was used to assist with the methodology used in the present analysis, among others for the computation of the opportunity cost of time of rural farmers.

7. Area profile

Chotiari Reservoir is located in Taluka Sanghar, District Sanghar, at a distance of about 30-35 km north-east of Sanghar town. It has a water storage capacity of 0.75 million acre feet (MAF). The main storage of the Reservoir has the Thar Desert on one side and is bounded by sand hills towards north, east and south-east and the Nara Canal towards the west and south. Bunds and dykes surround the reservoir: The Northern Bund (19 km long embankments), Western Bund (14 km), The Southern Bund (16km) and South Eastern Dykes (9km).

Created in a natural depression along the left bank of the Nara Canal its construction began in 1994 and was completed in 2003. The Chotiari Reservoir was designed to store the flood waters of River Indus during the flood season (June to September) and to release them as required in the winter (December to March) or early summer (April to June) season.

[3] Dehlavi A., Groom B., Naseem B.N. and A. Shahab. 2008. Total Economic Value of Wetland Sites on the Indus River. World Wide Fund for Nature – Pakistan, Indus for All Programme, Karachi. Forthcoming

There are depressions and *dhands* (lakes) in the area that are filled up with rain water and seepage from the Lower Nara Canal as well as the surplus water of Nara Canal. The largest *dhands* are Bakar and Makhi reaching a depth of 45 feet in places.

Chotiari Reservoir is comprised of a diversity of small and large size (1-200 ha) freshwater and brackish water lakes. These lakes are a source of subsistence and commercial fisheries for the local people and habitat for crocodiles, otters, fresh water turtles and feeding and nesting grounds for a variety of resident and migratory birds.

Land in the vicinity of the embankments is largely waterlogged with reeds growing in it. The area is a rich breeding and nesting ground for birds, and staging and wintering area for migratory waterfowl. The lakes and this area are rich in fish.

The reservoir lands cover seven clusters of villages (*dehs*) Makhi, Haranthari, Bakar, Phuleli, Akanwari and Khadvari.[4] There are a number of agriculture growers in this area and a majority of them are small growers.

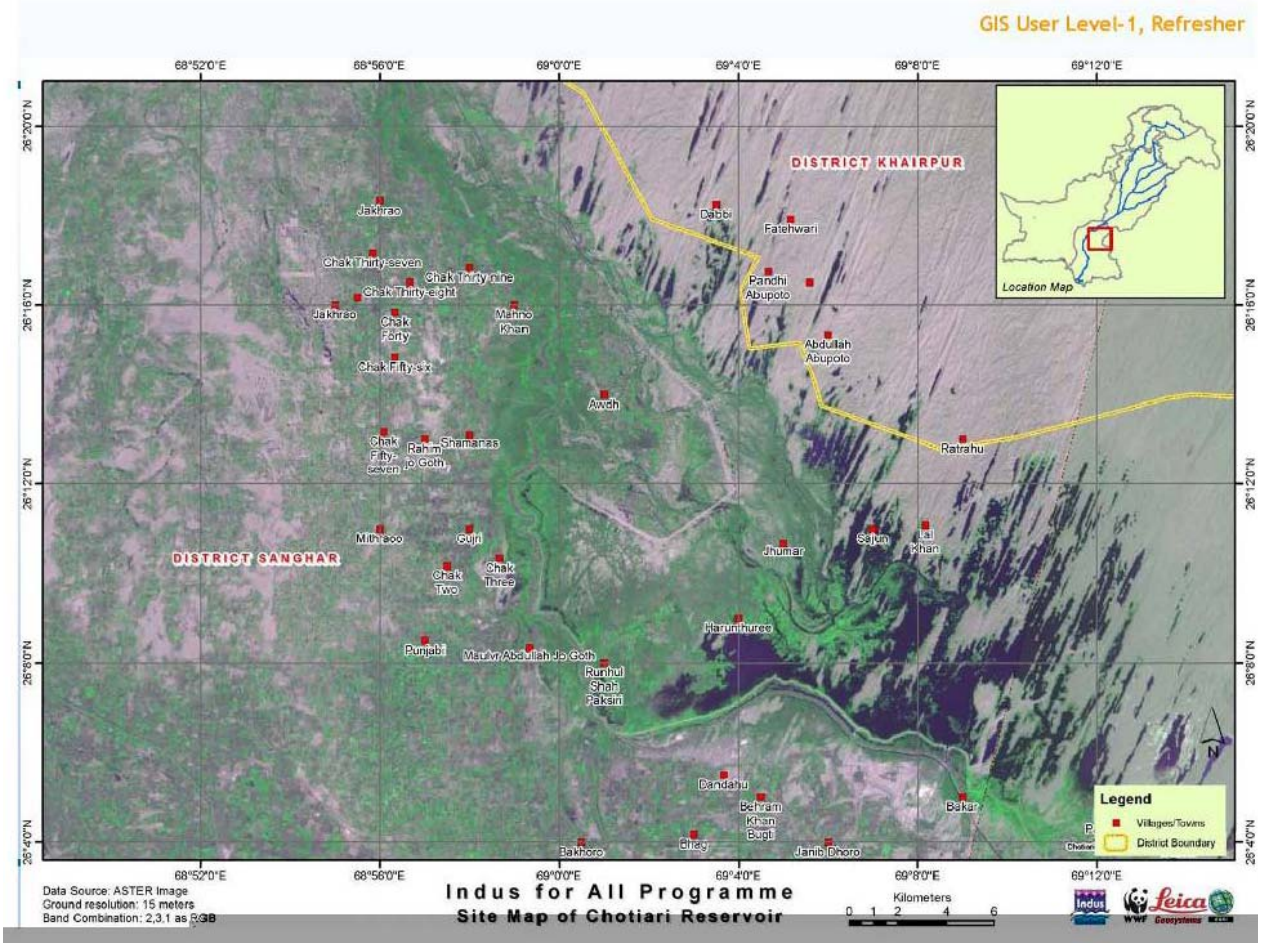
Based on the 1998 census for Sanghar district (latest available census), which notes an average annual population growth rate of 2.74 per cent (1981-1998), we extrapolate a 2009 total population of 1,956,182. Assuming an unchanged share of "skilled agriculture and fishery workers" and "elementary occupation" occupation categories, we estimate that farmers comprise 16 per cent of the total population of the 2009 total population (approx. 313,000).

The major crops grown during *Kharif* (April – September) are cotton, rice and sugar cane while wheat and pulses are major crops grown in *Rabi* (October – March). As regards irrigation, it is noteworthy that perennial canals feed the entire district – viz. Nara, Mithrao, Khipro, Dhoro, Samerjo, and main Rohri canal except for Khipro Taluka (lower portion) which is fed by Sukkhur barrage draining. In our sample, there were a handful of small land owners (under 10 acres) who irrigate using tube wells.

The area dedicated to cotton in fiscal year 1998 (latest data available) was 124,308 hectares at which time production was 524,935 metric tons, with a yield per hectare of 4,223 kilograms. In 1999, there were 58 cotton factories and 1 textile mill in Sanghar. At present, according to key informants, there are as many as 90 ginning units in Sanghar district.

[4] Socio Economic Assessment Study – Final Report – May, 2008 – WWF – MDC

Fig-1: GIS Image



8. Feasibility of the PES Scheme for the Cotton Growers of the Chotiari Reservoir Baseline & Additionality

The survey was conducted to establish the baseline and to assess the viability of a PES or a similar scheme in the Chotiari reservoir area. The following table delineates the descriptive statistics regarding the current cotton growing practices in the area.

Table 1: Current cotton growing practices (averages)

Type of seed	**BT 95%**
Water usage	**5.5 turn flood & furrow after 4.5 days**
Pesticide use	**5.5 sprays**
The use of Fertilizer • Urea • DAP	 **3 bags** **1 bag**
Type of ownership • Owner • Sharecrop	 **80%** **20%**
Per acre yield	30 mound* per acre
Area under BMP	0 acre
Adoption of BMP	100%

Sources: Field survey (19-21 November 2009), Chotiari; & DO Agriculture, Sanghar

* 1 seer = 0.933 Kgs; 1 mound = 40 seers = 37.32 Kgs

The survey results exhibit the current cotton growing practices regarding the use of seed, water usage, and the use of fertilizer and pesticide applications. The table reveals that almost 95% of the local farmers are making use of different type of BT cotton seed, whereas BT seed is a genetically modified seed and it is considered to be environmentally friendly because it requires less pesticides and water. However majority of the farmers are using illegal BT seeds, because according to the local expert licensed BT seeds is not locally available. Beside the use of illegal seeds the different varieties of seeds are also not harmonized with the local needs.

The current water usage is flooding the field for at least 5 times during the season and depending upon the availability of water, then filling the trenches after every 4 to 5 days.

Similarly, the pesticide use is very high, which is 5.5 sprays on the average of different chemical. Farmer generally uses 4 bags of fertilizers per acre.

The survey results also show that 80% of the farmers owners whereas, 20% are engaged in sharecropping. The average yield per acre is approximately 30 mounds (c. 40kg) per acre.

The information was obtained to evaluate the current practices of the cotton growers for establishing the base line. The information in the table is in agreement with those of the District Officer Agriculture of Sangar District.

The Table indicates that up to the last harvest, no single farmer was fully adhering to Better Management Practice (BMP). Therefore, the current cotton growing practice of the farmers in general, as is evident in the above mentioned Table, is set as the baseline and any increase in the BMP growing area shall be considered as additionality[5].

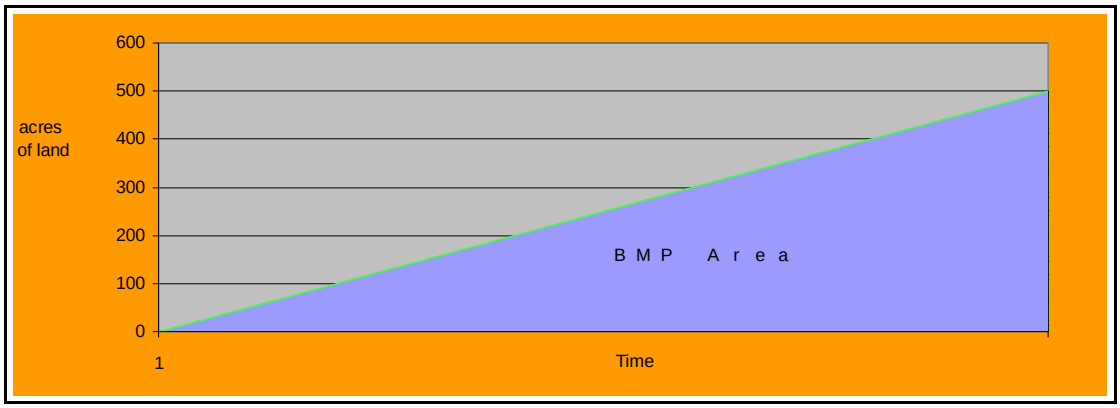
Having said this, during the same survey further inquiry was undertaken to assess the profitability of different land use options through focused group meeting and interviews for establishing the tradeoff, if any, for allocating the land under the BMP practices and current cotton growing technique.

The field survey assessed whether the respondents would adopt BMP practices from the upcoming cotton season starting from April 2010. All respondents were part of the informed group. They responded positively and fully agreed with the BMP adoption form the ensuing sowing in April 2010.

The ballpark estimation of the BMP sowing area is 500 acres (an increase from presently zero acres). However, many farmers agreed for BMP cotton sowing scheme conditionally, that is, subject to providing an expert for consultation and and assurance of a premium price. Figure 1 exhibits the additionality of the proposed PES scheme (area shown in blue).

[5] In the present context not a single farmer in the Chotiari area, is adhering to the concept of BMP, therefore we consider and increase in the cotton crop area practicing BMP as additionality.

Figure 2: BMP Area



9. Profitability of the two alternative farming systems

Figure 1 depicts the with scheme scenario, the vertical axis is measuring the area which is acres of land with and without scheme, whereas, the horizontal axis is measuring time (2009, 2010, etc.) which is in fact till the next harvest. The present state of BMP is zero acres which is likely to increase to 500 hundred acres till the next harvest conditional upon a PES scheme for the adoption of BMP in the study area.

Traditionally a scheme is considered “viable” or “feasible” provided the benefit of the scheme exceeds its opportunity cost. Literature available on the feasibility of the PES scheme suggest that the same is true for a PES scheme; in particular, the concept of “conservation opportunity cost”, or the cost of alternative land uses, is among crucial factors determining whether a PES scheme is applicable (*Wunder, 2005*).

For the present study, the profitability of the two land use types were computed, that is, rupee estimates were obtained for traditional vis-à-vis BMP uses to evaluate the willingness to accept of the provider. The information is based on the survey results and the information provided by the local BMP consultant.

The results in this regard are presented in Table 2 and in Figure 2 (see below). The data used in the computation was obtained from the 19-21 November 2009 survey and corroborated by existing net profit estimates available with WWF-P Indus for All's Programme Implementation Unit.

Table 2

Descriptions*	BMP PLOT	FARMERS PRACTICE
Land Preparation	4,000	3,800
Seed	1,000	1,000
Drilling & Dibbing	500	500
Weedicide	0	0
Phosphate Fertilizer	1,850	1,850
Nitrogen Fertilizer	1,550	2,100
Other	-	-
Intercultering No	2,600	3,500
Pesticide	0	1,940
Bio Pesticide	1,000	-
Picking	2,500	2,300
Total Expenditure	15,000	17,000
Total Income	36,000	34,000
Net Profit[6]	21,000	17,000

Source: Field survey (19-21 November 2009), Chotiari; & DO Agriculture, Sanghar
* All figures in PKR 2009 (per acre) unless otherwise stated

Figure 3: Profitability Chart

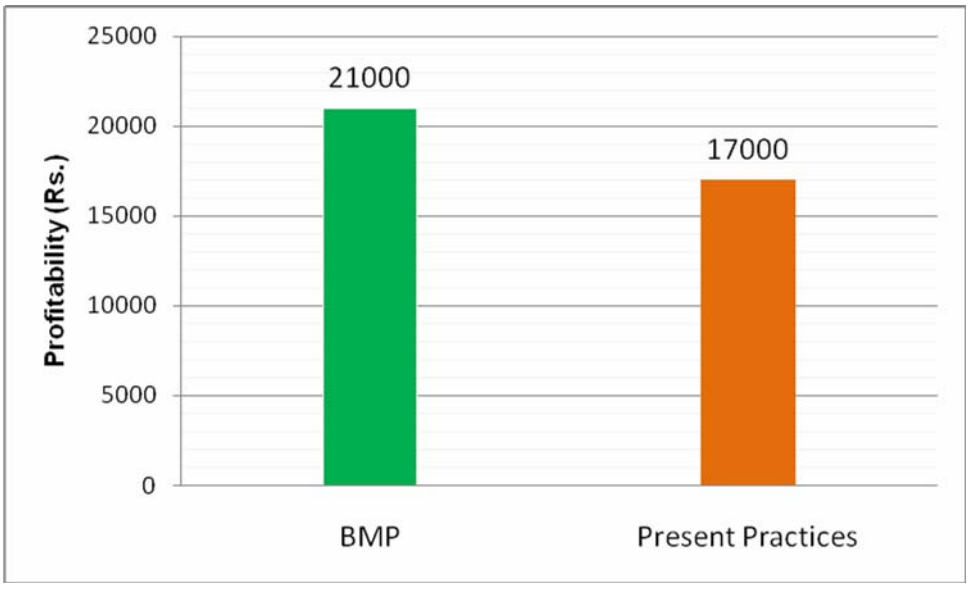


Table 2 report the per acre profitability of the two land options, measured in PKR. The table clearly reveals that the BMP is more profitable than the present cotton growing practices because of the fact that the per acre profitability is Rs. 4,000 more

[6]Net profit is usually taken as after tax difference between income and expenditure. However, in this context it refers to residue income after paying all the expenditure.

(Rs. 21,000 - Rs. 17,000), hence among the two alternative farming practices, BMP is more profitable than the traditional practices. Figure 2 is also in affirmation with the result. In figure 2, profitability in PKR is measure on the Y-axis and the two land options are measured on the X- axis.

At the present point of time one might be tempted to conclude that there is no tradeoff between the two farming system and since the proposed ES use is more profitable, therefore, there is no need for a PES scheme, in other word PES is not feasible. Nevertheless, the difference in profitability is not very significant, but the risk associated with the loss of a crop is colossal. The point was explained by a farmer who narrated that the present growing techniques have been adopted from ages and have been refined through experimentation and this has given them faith and trust in these growing techniques, but the proposed BMP practices are uncertain and they may lose at least 17,000 PKR per acre if they agree to the idea of BMP – i.e., they stand potentially to lose their entire income from the Kharif cotton growing season (this was also asked in question 7d of the survey instrument). The same opinion was expressed by other local growers. Neither WWF nor the consultants were prepared to ask any willingness to accept (WTA) question as it might have undermined the present ongoing BMP efforts in the area. Use of WTA would have enabled analysis of amounts of compensation required by the "farmers practice" group to shift towards the "BMP Plot" group.

Nevertheless, some of the growers responding to our questions regarding the acceptance of the scheme conditionally agreed to the BMP idea provided an expert is available in the area for consultation right from sowing until the harvesting of the crop. In particular, 17% of all 29 respondents replied in this manner, with a majority amenable to the idea in Sono Fakir Umrani village.

However, some of the growers are willing to adopt the proposed better cotton practices if a fair price is assured by the buyers or even if the any sort of human or man-made capital is provided. Hence this infers the willingness to accept 'rewards' for practicing the BMP.

Regarding the buyers, WWF already has acted as a broker to BMP cotton being purchased in Punjab province. The same buyers may be approached and are likely to express their willingness to pay a fair price to the local grower; however, experience suggests that they will almost certainly not pay a premium and may be reluctant to provide human or man-made capital (e.g., a basic health unit in lieu of cash payment as compensation), believing the provision of a fair price and correct weight measurement to be compensation enough.

Having said this, we formally conclude that a PES scheme: best management practice (BMP), agriculture model for ES under the Indus for All Programme is feasible for the Chotiari growers, owing to the elements of additionality, the willingness of the buyers and sellers (conditionally) to participate in the scheme.

However, we do not foresee that the outcome of the present feasibility report to be necessary and sufficient justification for providing a green light to proceeding with similar PES schemes in all areas of the Indus Eco-region. This is due to the fact that the methodology is understandably phenomenological and not analytical / positivist

as well as the fact that context-specific characteristics are responsible for the viability of schemes in all instances. For that reason, we recommend separate evaluation of every new initiative in other part of the project area.

We recommend a follow-up process for creating a 'market' for the implementation of the scheme and a comprehensive plan to start negotiation with the service providers and the beneficiaries, product to be delivered, time line and monitoring and evaluation mechanism. Recommendations on a streamlined working future PES scheme, most suitable PES scheme types, future efficiency management, and modes of payment are discussed in the “PES Plan” accompanying the present PES feasibility.

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Payment for Environmental Services (PES)

IMPLEMENTATION PLAN

For Better Management Practices (BMP)

Agricultural model for environmental services (ES)

Promoting BMP Cotton Crop in Chotiari Reservoir Area in Sanghar District

November 2009

Developed by

Rao Sustainable Development Consulting & Services (SMC-Pvt.) Limited (R-SDCS)

ABBREVIATIONS

BMP	Best Management Practices
CBOs	Community Based Organizations
DCC	District Coordination Committee
ES	Environmental Services
FFS	Farmer Field Schools
GIS	Geographic Information System
Ha	Hectares
IDDRI	Institute Du Development Durable-et-des Relations Internationales
M&E	Monitoring & Evaluation
NWFP	North West Frontier Province
PES	Payment for Environmental Services
PIU	Programme Implementation Unit
PMU	Programme Managemwent Unit
TEV	Total Economic Value/Valuation
WWF-P	World Wide Fund for Nature (Pakistan)

CONTENTS

Executive Summary

Cotton growing in Pakistan (Sindh and Punjab Provinces are the main producers) is currently heavily dependent on intensive use of agro-chemicals, all of which have negative impacts on human health, environment and ecosystems. There is potential risk of losing the crop or significant reduction in yield in the absence of these inputs due to elimination of predator insects and birds with intensive use of pesticides in the past. Traditional farming is not sustainable for the poor farmers due to heavy investment, negative social and environmental impacts and the futuristic market for organically produced agricultural products. Hence, Payment for Environmental Services (PES) for BMP (Best Management Practices) is necessary for convincing, motivating and taking care of the risks of the producers in lieu of the environmental services they will provide.

This scheme fulfils all three prerequisites necessary for functioning of PES market (1) a PES market has been indentified during the PES experimental initiatives of WWF-P in Bahawalpur; (2) the key processes and relationships have been designed in the light of the preparedness and experience of trying to grow BMP cotton in this area and (3) the institutional environment is supportive to take such initiatives for institutionalizing the BMP. The environmental services for the PES market are clearly defined. These relate to protecting the local environment and health of the poor rural people, conserving the biodiversity of local, provincial, national and global significance and providing almost organically produced cotton for the buyers.

The potential intermediate buyers and the end consumers are aware of the environmental value of the products made from the BMP cotton and are willing to pay premium prices, even if they are not aware of the PES concept. The producers of BMP cotton, as the providers of environmental services, are able and willing to cooperate almost (soft conditions) on a voluntary basis. This PES scheme is transparent and even the element of conditionality is clear. The implementation of the scheme is expected to establish the trust between the buyers and sellers. The institutional environment of PES is supportive as WWF-P and its Indus for all and PES initiatives are credible. The District Coordination Committee is functional for resolving any conflicts between the parties. The land ownership rights or usufruct rights in case of share croppers are clearly defined

The PES schemes is premised on the conclusion of the Feasibility report that the net income from the BMP cotton is more than from the traditionally cultivated, even if the premium price is not paid by the buyers to the providers. The additional income will contribute to improve livelihoods of the participants and better environmental conditions. The poor are welcome to access and participate in the scheme.

There is no minimum area limit on the size of holding for participation in the scheme, since most of the holdings are small. The share croppers will also be eligible It is however, important that the PES intermediaries facilitate the participants in maintaining records of income and expenditure and in getting fair deals from the suppliers of inputs and from the buyers of BMP cotton. The participation in this PES scheme would be voluntary as an “entire village” approach is not adopted. The scheme is simple as the elements of poverty reduction have not been incorporated in it. Channelling the payments towards women and in to a Fund

for communal improvement in land management have also been left out. Participation requirements will be met fully.

The target population is the cotton growing farmers in the Chotiari Reservoir area. A target of growing BMP cotton on 500 ha, in 2010, is considered doable. This PES Plan is for 2010 to cover the full cotton growing, harvesting and selling season. The farmers who will join the PES Scheme will need intensive technical support for growing and selling BMP cotton, involving negotiations with the ES buyers. Indus for All Programme and the Sindh Agriculture Department will have to play key role in supporting the participant farmers. A comprehensive monitoring system and its implementation will be necessary. Indus for All Programme (WWF-P) will need donor support for implementing this Plan.

1. INTRODUCTION

1.1. Background

Chotiari Reservoir Area:

Chotiari Reservoir area comprises a diversity of small and large (1-200 ha) freshwater and brackish lakes in an arid climate, which are a source of subsistence and commercial fisheries for the local people; habitats of marsh crocodile, otter, fresh water turtles; and staging, wintering, feeding and breeding areas for a large number of resident and migratory birds.

Seven clusters of villages (*dehs*) i.e. Makhi, Haranthari, Bakar, Phuleli, Akanwari and Khadvari[1]are located in this area. Majority of the households are dependent on farming of small land holdings, fisheries and livestock grazing for livelihood. Major crops grown in this area include sugarcane and cotton, for which pesticides are used intensively.

Some of these lakes are prone to pollution from the agrochemicals (insecticides, weedicides and fertilizers) used in cotton growing with prevalent practices, with adverse impact on water quality, fisheries, and waterfowl and other aquatic wild animals. The crop yields of many farmers are said to have reduced and the skin and many other diseases are common among the cotton pickers due to the prevalent agricultural practices. The ground water in many villages is brackish and is also likely to be contaminated with the seepage of pesticides.

WWF-P has implemented PES schemes in the various areas of Pakistan in the recent past. These initiatives related to areas in NWFP, Gilgit-Baltistan region and Punjab Province. The later related to BMP cotton growing in Bahawalpur. The current initiative in the adjoining areas of Chotiari Reservoir, in a way, replicates the successful experience of WWF-P's BMP cotton growing in Bahawalpur.

PES scheme is being planned to promote BMP cotton growing in the area of Chotiari Reservoir for which feasibility has already been conducted. This exercise is focusing on preparation of a PES plan for implementation.

1.2. PES for BMP in agriculture for biodiversity conservation

Emphasis on increasing yields and productivity has in some cases had negative consequences on environmental sustainability. These consequences were often not foreseen as they occurred over time and, some occurred outside of traditional farm boundaries. Inappropriate fertilization has led to eutrophication and large dead zones in a number of coastal areas, e.g. Gulf of Mexico, and some lakes, and inappropriate use of pesticides has lead to groundwater pollution, and other effects, for example loss of biodiversity.

Biodiversity conservation is provided by all natural ecosystems. The success of Payments for Environmental Services (PES) programme implemented in France was documented[2], where farmers were financed to change their farming practices to reduce the risk. The

Socio Economic Assessment Study – Final Report – May, 2008 – WWF – MDC

[2] *S. Wertz-Kanounnikoff / Institute du development durable et des relations internationales (IDDRI) / Institute for Sustainable Development and International Relations , 2006*

literature review on payments for environmental services (PES) regarding biodiversity is provided in a paper[3]. Another paper[4] examines the role of agriculture in the provision of ecosystem services using the (PES) approach.

It is difficult to place a correct value on biodiversity conservation services due to their intangible nature. The scientific uncertainties concerning this service and the difficulty to identify and quantify beneficiaries imply high transaction costs. But it is possible to take forward the concept in stages from simple to advance. This plan intends to take this route of simple to start with.

WWF-P has introduced and implemented the concept of PES, mainly for biodiversity conservation in the various parts of Pakistan including NWFP, Gilgit-Baltistan Region, and Punjab and lately in Sindh. The PES work in Bahawalpur (Punjab) and Chotiari Reservoir area of Sindh is on BMP cotton growing.

2. PES SCHEME

Wunder (2007) and Engel et al. (2008) define PES as follows:

"A *voluntary* transaction where a *well-defined* environmental service is being bought by a buyer from a service provider if and only if the provider secures the provision (*conditionality*)"

Three conditions for the design of "genuine" PES:

- The relationship between the promoted land use and the provision of the environmental service must be very clear
- Stakeholders must have the possibility to bring to an end the contractual relationship (voluntary transaction)
- A monitoring system must be in place, in order to ensure that the provision of services is taking place

2.1. Rationale

There is little recognition of the ecosystem functions that mitigate the environmental impacts. The environmental shortcomings of agricultural practice associated with poor socioeconomic conditions create a vicious cycle in which poor smallholder farmers have to use new, often marginal lands, with overall degradation. The loss of soil fertility, soil erosion, breakdown in agro-ecological functions, land abandonment, and ever-increasing movement into marginal land result in poor crop yields.

Many of the challenges facing agriculture currently and in the future will require more innovative and integrated applications of existing knowledge, science and technology (formal, traditional and community-based), as well as new approaches for agricultural and natural resource management. Agricultural soil and biodiversity, nutrient, pest and water

[3] *(D. Perrot-Maître / International Institute for Environment and Development , 2006*
"Can biodiversity be conserved through direct payments to landholders to adopt sustainable land-use practices?"
[4] *Food and Agriculture Organization of the United Nations , 2007*
The state of food and agriculture 2007: paying farmers for environmental services

management, and the capacity to respond to environmental stresses such as climate change can be enhanced by traditional and local knowledge systems and current technologies

Technological options such as new genotypes of crops, biotechnology, agro-ecology, integrated pest and nutrient management have created opportunities for more resource-efficient and site-specific agriculture

Cotton growing in Pakistan (Sindh and Punjab Provinces are the main producers) is currently heavily dependent on intensive use of pesticides, weedicides and chemical fertilizers, all of which have negative impacts on human health, environment and ecosystems. There is potential risk of losing the crop or significant reduction in yield in the absence of these inputs due to elimination of predator insects and birds with intensive use of pesticides in the past. Traditional farming is not sustainable for the poor farmers due to heavy investment, negative social and environmental impacts and the futuristic market for organically produced agricultural products. Hence, PES is critical for BMP cotton growing for convincing, motivating and taking care of the risks of the producers in lieu of the environmental services they will provide.

2.2. Methodology:

The target population for the PES intervention was the 'Informed Group' of 50 large and small growers who participated in the applied BMP at two demo plots set up by the Indus for All Project of WWF-P in April 2008 at Chotiari and Din Suno Faqir Umrani villages in Chotiari Reservoir Area. They were from the same or surrounding villages. They participated in the process of cotton production to factually experience the 'Green Cotton' growing initiative in the area. 29 volunteer farmers out of 50 large and small cotton growers from this group were interviewed regarding their experience of BMP cotton growing.

Survey and focus group meetings were also held to obtain information necessary to formulate recommendations for both the PES feasibility and plan. Expert opinion was sought to get further insight in the matter.

2.3. PES Feasibility:

A survey, using a questionnaire for interview, focus group meetings and expert opinion, was undertaken in the Chotiari Reservoir area in Sanghar District to establish trade-off between the two scenarios and to establish additionality with the objective of finding out the feasibility of (BMP) cotton growing in the future with or without compensation to the farmers, in case of loss in income compared with the cotton grown with the current environment un-friendly practices; followed by scoping for a PES scheme based on the prevalent compensation rates / practices or needed/agreed compensation and positive response of the farmers (producer sellers) , Environmental Services (ES) buyers and other stakeholders interested in promoting or compensating for the ES and the willingness to participate in the scheme.

2.3.1. Baseline:

The salient statistics of the baseline, based on the survey conducted under the assignment by the consultant, that matches with the results of a field survey[5] of District Officer

[5] *Source: Field survey (19-21 November 2009), Chotiari; & DO Agriculture, Sanghar*

Agriculture, Sanghar, are that there are 80% owners and 20% share croppers. BT 95% seed is used. 5.5 turn flood & furrow irrigations are applied at an average interval of 4.5 days. 5.5 sprays of pesticides, 3 bags of urea and 1 bag of DAP fertilizer are used. The average yield of cotton per acre is about 1.2 ton. So far, there is no area under BMP cotton crop.

2.3.2. Conclusion:

It is concluded from literature review, survey, discussions with the growers/sellers and buyers, and analysis that a PES scheme: (BMP), agriculture model for ES is feasible for the Chotiari area cotton growers, owing to the elements of additionality, and the willingness of the buyers and sellers (conditionally) to participate in the scheme.

Any increase in the BMP growing area shall be considered as additionality. There is potential for covering 500 acres of cotton areas with the BMP cotton in *Kharif* 2010. This is, however, subject to the cotton growers getting the access to BMP expert for frequent consultation (availability of expert in the area for consultation right from sowing until the harvesting of the crop) and assurance of premium price (economic incentive) or any other reward.

Between the two farming practices i.e. BMP and traditional, the former is more profitable with net income of Rs 21,000/- (gross income Rs. 36,000/-; expenditure Rs 15,000/- per acre) than the latter with net income of Rs 17,000/- per acre (gross income Rs 34,000/-; expenditure Rs 17,000/- per acre respectively).

Although BMP use is more profitable but firstly the difference in profitability is not significant and secondly, the local cotton growers apprehend the risk associated with BMP cotton growing extending to colossal loss of crop in case of pest epidemic. Their reservations cannot be alleviated without offering them economic incentive.

The potential buyers have expressed their willingness to pay a fair price to the BMP cotton growers. Their motivation is from the better quality and better international prices for the BMP cotton, which include the consideration of ES. The support of the proposed PES scheme staff will be crucial in getting fair price from the buyers to the BMP cotton growers.

2.4. Salient Features

This scheme fulfils the three types of prerequisites necessary for functioning of PES market (1) a PES market has been indentified during the PES experimental initiatives of WWF-P in Pakistan. This scheme is trying to almost replicate the experience of growing BMP cotton in Bahawalpur; (2) the key processes and relationships have been designed in the light of the preparedness and experience of trying to grow BMP cotton in this area. The experience is documented in the PES Feasibility Report, which provides a basis for this scheme; and (3) the institutional environment is supportive to take such initiatives for institutionalizing BMP.

In terms of Identification of the PES market, the environmental services to be provided are clearly defined. These relate to protecting the local environment and health of the poor rural people, conserving the biodiversity of local, provincial, national and global significance and providing almost organically produced cotton for the buyers. The Potential intermediate buyers and the end consumers are aware of the environmental value of the products made from the BMP cotton and are willing to pay premium prices, even if they are not aware of the

PES concept. The producers of BMP cotton, as the providers of environmental services, are able and willing to cooperate almost (soft conditions) on a voluntary basis.

The PES processes and relationships regarding the types, forms and levels of benefits are clearly known to the providers of ES as they have been exposed to the various aspects of these during the trial experience of last year's close-to-BMP cotton farming in this area and have benefitted from trainings and information. These are adapted to the local conditions. This PES scheme is transparent and even the element of conditionality is clear. The trust between the buyers and sellers of environmental services is not yet established but the implementation of the scheme is expected to establish the same.

The institutional environment of PES is supportive as WWF-P and its Indus for all and PES initiatives are credible. These have proven record of successful intermediation and supporting the communities as well as well as of improving the environment. The supportive legal and regulatory framework is in not in place.

But the implementation of the scheme is not likely to be negatively impacted in its absence as the transactions between private individuals and the private sector are safeguarded through the Contact Law of Pakistan, WWF-P is a credible intermediary and the District Coordination Committee meets to oversee functioning and resolving conflicts. The experience learned during implementation of the scheme, however, is expected to be institutionalized through enactment or amendment of policy, law or procedures. The land ownership or usufruct rights in case of share croppers are clearly defined in the area of the scheme and are in vogue*.*

This PES Scheme is being set up because of the following conclusions:

- There is potential to effectively spark improvements in environmental management and the availability of sufficient demand to support the scheme in the long run.
- The targeted providers can generate the highest environmental benefits at the lowest costs.
- The beneficiaries of environmental services understand the benefits they can realize from participating in such mechanisms and also their respective responsibilities.
- Although the enabling legislation is not in place to allow the negotiations and agreements to evolve, formalize and thrive but such laws can be based on successful practices. This scheme will help in evolving and refining practices and identifying the need, based on the implementation issues, to attract the attention of the policy makers and legislators to evolve, formalize appropriate regulations and procedures.
- The design of this PES scheme is not resulting from a direct deal between providers and beneficiaries. However, like most PES schemes this is resulting from the combined efforts of a support team involving a wide range of scientific and legal experts, and intermediaries at different levels.
- Securing long-term financing streams from beneficiaries has not been possible. However, maintaining low transaction costs will be possible, which will affect directly the life expectancy of this PES scheme.

- A key component for long-term survival is the contingency of payments, which will be assessed during the implementation of the scheme. The other component is the accountability of providers for which a sanctioning mechanism has been included in the scheme as the buyers will not continue to participate without value for money.
- The pro-poor concerns are inbuilt in the design of the PES scheme in terms of improving the livelihoods of the rural poor farmers.
- Regarding the Pro-poor PES options:
- This PES scheme is not a poverty alleviation tool per se as the providers communities already have ownership or use rights over the natural resources.
- The PES scheme is premised on the conclusion of the Feasibility Report that the net income from the BMP cotton is more than from the traditionally cultivated, even if the premium price is not paid by the buyers to the providers. The additional income will contribute to improve livelihoods of the participants and better environmental conditions. The poor are located within the environmental priority area (Chotiari reservoir) and are welcome to access and participate in the scheme.
- Setting up a long term PES scheme can be a lengthy process, requiring institutional change, extensive negotiations and substantial start-up funding, all of which are not possible to identify, negotiate or manage respectively in the short period of developing the Feasibility Report. The types of payments will be negotiated early during the implementation of the scheme.
- The farmers, generally, face great difficulty due to lack of or less access to information, facilitation mechanisms and financial resources. They are also sceptical about the unknown results of experiments to changes in the traditional practices.
- Participation requirements will be met fully. The eligibility criteria for participation in the scheme are simple. There is no minimum limit on the size of holding since most of the holdings are small. Both land owners and share croppers will be eligible since extra financial inputs are not involved and the land owner in the latter case will also be benefitting from BMP cotton in terms of higher income, less expenditure and preferential treatment by the buyers. It is however, important that the PES intermediaries facilitate the participants in maintaining records of income and expenditure and in getting fair deals from the suppliers of inputs and from the buyers of BMP cotton in terms of prices, weight and payment schedule
- It is also important that the cost of participation in the scheme for small farmers is not prohibitive in terms of finances, time and convenience. The risk to food security of the small farmers and reduction in their insurance assets such as trees and livestock in times of crisis or moving cattle in times of draught into land set aside from grazing.
- The participation in this PES scheme would be voluntary as an “entire village” approach is not adopted. This would enhance the effectiveness of the compensation scheme because of its self enforcing nature.
- Since this would be the beginning of the PES scheme in Chotiari Reservoir area, it was important to keep it simple. It is for this reason that the elements of poverty reduction such as maximizing the multiplier effect have not been incorporated in it.

- Although channelling the payments towards women has been shown to be particularly effective in increasing spending on education, health and nutrition, this element is also not included because of the additional reason of likely unwillingness on the part of the farmers (mostly male). Similarly, channelling the payment in to a Fund for communal improvement in land management has also been left out.

2.5. The PES Plan

A follow-up process for creating a 'market' for the implementation of the scheme has been started. This comprehensive plan will help in starting negotiations with the service providers and the beneficiaries. Target, outputs and products to be delivered are identified and planned for implementation in 2010. A Monitoring & Evaluation mechanism has also been suggested in the plan.

The PES plan is a management plan. It follows from a biophysical and environmental threat diagnosis carried out by the Indus for All Programme, being implemented by WWF-P in dealing with the institution of better management practices (BMPs) through training of cotton growers in farmer field schools (FFS). The mounting land use pressures have been documented well separately by the Programme through literature review. Therefore, these are not discussed in detail in the PES feasibility, which notes that there is an established need to secure ecosystem conservation and restoration. Further, a socioeconomic diagnosis of the actors involved has been carried out.

It is therefore fair to assume that the Programme has a working knowledge of environmental service (ES) sellers, including organizational capacities and identification of characteristics, which may affect PES functioning. The PES plan nevertheless details principal assumptions, risks and mitigation strategies.

It should be noted that the PES plan does not rely on an economic appraisal or total economic valuation (TEV) of BMP related ES as is discussed in the PES feasibility. As such, a TEV is not essential to the establishment and successful functioning of a PES scheme.

In principle, the literature notes that any price the ES buyer and seller negotiate is “the right price” (Wunder, 2005). In our case, the calculations of net margins in the “PES feasibility” will help – primarily to pre-determine whether a PES scheme is realistic, but also to strengthen the negotiation position of the seller (buyer responsiveness is expected to be greater in the presence of transparent and impartially computed net margins).

As a management plan, the PES plan is itself a PES mechanism proposal. Its starting point is a PES feasibility which made clear that a PES scheme is realistic. It should be added that a scheme is realistic beyond a mere feasibility owing to the Programme’s strong presence on the ground in the form of its Programme Implementation Unit (PIU) as well as effective institutional arrangements such as District Coordination Committee meetings (essential for conflict resolution, among others) and farmer field schools (essential for promotion and dissemination of better management practices and training of ES sellers).

The PES plan, thus, details standard steps used for such plans. A few steps, as already outlined above, namely: biophysical and environmental threat diagnosis, socioeconomic diagnosis of the actors, and a TEV have already been taken. The first of these is setting a realistic ES target, while related activities / steps include promotion and dissemination of a

scheme (including training of ES sellers), estimation of the corporate beneficiary's willingness to pay and scope.

The PES design and implementation, as a cycle, will be subjected to continuous check points and feedback loops with appropriate level of flexibility and adjustment to ensure that design gaps are addressed and the scheme expands responding to changing conditions and priorities.

2.5.1. Targets, Activities/Steps & Responsibilities

The target population is the cotton growing farmers in the Chotiari Reservoir area. A target of growing BMP cotton on 500 ha in 2010 is considered doable for trading of environmental services by the cotton growers with the ES buyers i.e. the entrepreneurial ginners and textile manufacturers. This PES Plan is for 2010 to cover the full cotton growing, harvesting and selling season. The farmers who will join the PES Scheme will need intensive technical support for growing and selling BMP cotton, involving negotiations with the ES buyers. Indus for All Programme and the Sindh Agriculture Department will have to play key role in supporting the participant farmers. A comprehensive monitoring system and its implementation will be necessary. Indus for All Programme (WWF-P) will need donor support for implementing this Plan.

The outputs and activities to achieve this target are listed as under as well as included in Table-1 along with information regarding the specific target groups, key implementing agencies and other stakeholders:

1) Promotion and dissemination of the PES scheme in 2010

- Enhanced awareness of:
    - Communities, especially cotton growers in the seven clusters of villages (dehs) regarding BMP cotton growing and
    - Potential ES buyers regarding the resultant ES.
- The existing farmer field schools (FFS) are appropriate for this purpose.
- Besides promotion and dissemination, the FFS is also the appropriate forum for training of ES sellers

2) Estimate the corporate or beneficiary population's willingness to pay

- Meetings should be held in 2010 with large composite textiles companies, headquartered in Karachi, with whom WWF-P already has BMP cotton sales experience in Punjab.
- Such composites must own ginning units in Sanghar
- Formal willingness of ES buyers obtained for premium price or other compensatory packages for ES providers;

3) BMP Cotton growing practices introduced and expanded on 500 ha in the Chotiari Reservoir Area.

The farmers will require heavy technical input.

4) Inputs and technical support for BMP cotton growing provided to ES providers/ cotton growers/ sellers by the Indus for All and Agri. Department

5) Negotiations between BMP cotton growers/ sellers and buyers facilitated by Indus for All Programme (WWF-P); regarding specific commitment to purchase at premium price or to compensate in any other form. Signing of medium-term bilateral agreements/contracts with ES sellers at Chotiari and ES buyers will be important for establishing the trust between them

6) Ensuring compliance and fair deal through monitoring and evaluation; and sanctioning in case of violations in accordance with the provisions of the formal Agreements to be concluded with the ES providers and ES buyers.

7) Drawing a regulatory framework:

Regulating market forces through strict regulation and effective enforcement may not be necessary to start with. A free market mechanism is preferable for promotion of PES for BMP cotton growing. A formal regulatory mechanism may be developed later on and based on the experience of implementation of the Plan during 2010. However, the informal regulatory mechanism may be evolved, as needed, and practiced and perfected in the mean while.

8) Establishment of Fund:

New and additional financial resources are required to support sustainable, democratic and well-enforced public governance of biodiversity, including through redirecting perverse incentives. The Costa Rican carbon and genetic resources 'markets' were only developed as a result of a combination of government intervention, generous Official Development Aid and other donor support. As soon as these markets were left unsupported, they proved economically unviable. Moreover, the success of the Costa Rican PES scheme might have been the result of the fact that deforestation was also illegal.

Initially the Fund is expected to receive donation from the donor funds for implementation of this PES Plan. But for sustainability, it will need contributions from ES buyers and ES providers, with whom it will have to be negotiated during the implementation of the PES Plan.

9) Execution of the management plan

The need for a management plan for 2010 will be served by this PES Plan but for the PES Scheme to operate over a long term, a management plan will need to be developed.

10) Establishment of a certification, M&E system for ES

- **Certification**

Certification of the BMP growers will be helpful in getting them premium price for their BMP produce or for getting compensated in any other way. Such mechanism will have to be evolved fairly quickly.

- **Efficiency Measurement**

Previous to the implementation of the scheme, and indeed previous to the design of the plan, "PES feasibility" has already established a baseline for additionality measurement. The baseline covers achievement indicators for three aspects considered essential for cotton

BMP-type PES (kindly reference the survey instrument appended to the “PES feasibility” document):

- **Technical:** sowing method, fertilizer application, irrigation, and plant protection.

- **Economic**: impacts on the economic status of ES sellers, in particular covering land ownership, sharecropping arrangements, per cent share of income relying on “own farm agriculture” and, importantly, net margins from BMP/non-BMP cotton growing. It is recommended to administer a new instrument that extends household characteristics to cover indicators for “economic status” that will be important for ex-post impact measurement. This should be administered in the first quarter of 2010 or earlier in order to qualify as part of the baseline.

- **Social:** the number of participants directly involved in the PES (sellers of the ES) and the population sensitized in cotton BMP practices.

If possible it would be best to consult the ES buyer on the identification of the right indicators for efficiency measurement besides the achievement indicators described in the “technical”, “economic” and “social” categories (above). The reason for this is that, in order for the PES scheme to be effective, the ES buyer must be “convinced” of the benefits of the mechanism. There is no better way to ensure this than to involve the ES buyer in the design of the efficiency measurement indicators. Initially, the monitoring mechanism will be visited by the PIU staff and the Programme’s M&E officer. At a later stage, a more permanent monitoring mechanism may be considered, for example periodic visits from members of the “implementing institution of the PES” and review of performance in the quarterly “District Coordination Committee” (DCC) meetings.

- **Monitoring & Evaluation**

The conduct of monitoring and evaluation is essential and must be conducted periodically. The periodicity may be timed with existing FFS meetings. The tools to be used will include farm-use maps as a baseline already determined through geographic information system (GIS) points collected during the 19-21 November survey. They will also include farm by farm inspection. In this regard, timed before each quarterly District Coordination Committee (DCC) meeting there will be a randomly-determined farm inspection. In the case of PES violations reported by members of the “implementing institution of the PES” (who will carry out the monitoring in the long term), sanctioning protocols are described in the relevant section of the present PES plan.

The Programme would need to address potential issues relating to the M&E component of the PES plan, in particular: (a) smooth transition from (the short term) PIU and PMU monitoring team visits towards visits (in the long term) by members of the “implementing institution of the PES” ; (b) assuring that long term visits in the absence of the WWF are in fact regular at the specified periodicity and not interrupted by irregular meeting dates of the DCCs to which these are linked; and, (c) the “implementing institution of the PES” and DCC may not consider PES objectives and may exercise a high degree of flexibility while interpreting reported violations and enforcement of their sanctioning.

- **Non-compliance and sanctioning**

Sanctioning should be a last resort. The likelihood of non-compliance should be addressed from the outset by designing incentives to match the current income of the ES providers from productive activities. The individual or collective incentives need not involve cash payments. In order to on establish what incentives match incomes, the Programme should confer with established CBOs, particularly those participating in the FFS.

As regards provision of collective non-cash incentives, the Programme may wish to revisit results of needs assessments in such documents as the preliminary and final socioeconomic baseline. In the case of Village Umrani, the ground water is brackish. With the exception of Fateh Mohammad Aryan which is surrounded by canals, households do not have ready access to drinking water. Therefore construction of a canal link may be considered. In the case of Chotiari Village too, a water supply scheme is necessary owing to an increase in the pH level of water. A majority of those surveyed from 19 – 21 November 2009 responded that drinking water was the priority problem they faced (see question no. 5 in the survey instrument appended to the PES feasibility).

The "implementing institution of the PES" must be notified and empowered to assess non-compliance and carry out sanctioning. It should consist of a committee that includes representatives of the WWF, local government, the ES seller and buyer, and relevant stakeholders such as the Small Growers Association (which covers Talukas Sinjharo, Khipro and Jam Nawaz Ali besides Sanghar and has 1,000 - 1,500 members). A specific legal framework for the PES is not necessary in WWF's experience.

Progress reviews and early warning systems should be implemented to avert non-compliance and issues raised in this regard at the District Coordination Committee (DCCs) meetings. The Programme supports and oversees these meetings, chaired by the District Coordination Officer and held quarterly. The last meeting was held on 22 December 2009. The DCC meetings are already serving as an important conflict resolution platform.

Sanctioning will consist of immediate suspension of "privileges" or "payments". If the person does not appeal to the "implementing institution of the PES", they must return money paid to date together with interest rates determined by the "implementing institution of the PES", the latter also determining the means of sanctioning if privileges are suspended for a public good in lieu of cash payment.

Identification, bringing on record and to the notice of violators in writing of the violations will be necessary from the very start of the scheme but some flexibility will have to be shown in sanctioning in the first year i.e. 2010. The regimes will also need to be adjusted in the future in the light of the first year's experience.

11) Documentation and analysis of the ES system

This is very important for perfecting and standardisation as well as for scaling up and replication in the Indus eco-region. This input would come from the M&E Team.

Data sources and data collection methods for monitoring and future additionality assessment will be developed.

Assuming that the ES sellers are FFS participants interviewed in November 2008, the Programme would need to re-implement the survey instrument in November-December 2010

Assumptions, risks and mitigation strategies

Assumptions:

- Full participation in a formal notified "implementing institution of the PES"
- Active support of Small Growers Association and local government
- The cotton growers will be receptive
- Progressive growers will be willing to share their experiences.
- ES buyers are interested
- It will be possible to achieve this target of 500 ha
- It will be possible to generate funds and support the growers
- Both ES providers 7 Buyers will agree on a reasonable arrangement
- Compliance and monitoring, although difficult, will be possible with minimum need for sanctioning. Some flexibility will however be built in to accommodate genuine difficulties and adjustments

Risks:

The risks may include:

- Unforeseen impacts on yield:
- Weather (irrigation and plant protection regimes depend on weather);
- Pest attacks (mealy bug, jassids, aphids, bole worm, viruses etc);
- Untimely canal closure or breaches in canal system.
- Power supply fluctuations, load shedding in case of irrigation by tube wells; and
- Fluctuations in raw cotton prices.

Mitigation strategies

One of the areas where difficulties may arise from growers due to foreseeable risks is the application of prohibited inputs or inputs more than needed. The availability of the BMP expert and building of confidence of the growers by him will be helpful in this regard.

Some flexibility and adjustments in certain other regimes and practices according to the local needs will also be necessary until such time the best practices are firmed up for the future.

District Coordination Committee (DCCs) meetings will be used as a conflict resolution platform

The outputs, activities, target groups, implementing agencies and other stakeholders are summarised in Table-1.

Table-1: Outputs, Activities, and stakeholders

Output No.	Output	Activity	Target Group	Responsible Organizations	Stake- holders	Assumptions/risks and mitigation strategies
1.	Awareness enhanced of (1) communities, especially cotton growers in the seven clusters of villages (dehs) regarding BMP cotton growing and (2) potential ES buyers regarding the resultant ES	Disseminate the results of PES Feasibility	Communities, in particular cotton growers ES buyers	Indus for All (WWF-P)	Agri. Dept. Ginners and Textile Associations Export Promotion Bureau	-The cotton growers will be receptive
		• Use the progressive growers in dissemination of results • Disseminate ES of BMP cotton to the potential ES buyers				-Progressive growers will be willing to share their experiences. - ES buyers are interested

Output No.	Output	Activity	Target Group	Responsible Organizations	Stake- holders	Assumptions/risks and mitigation strategies
2.	Willingness of ES buyers obtained for premium price or other compensatory packages for ES providers	• Arrange dialogue and negotiations with the potential ES buyers.	ES buyers	Indus for All (WWF-P)	BMP cotton growers Ginners and Textile Associations Export Promotion Bureau	- ES buyers are interested
3.	BMP Cotton growing practices introduced and expanded on 500 ha in the Chotiari Reservoir Area.	Obtain and review the revenue record of ownership/ share cropping of land, cotton growing areas, and irrigation sources for selecting the suitable cotton growing villages	Cotton growers	Indus for All (WWF-P)	Agri. Dept.	It will be possible to achieve this target.
		Prioritise the villages, specific lands and growers, using a criteria, for inclusion in the PES Plan				

Output No.	Output	Activity	Target Group	Responsible Organizations	Stake- holders	Assumptions/risks and mitigation strategies
		Arrange a comprehensive survey of the cotton fields assigned to BMP cotton growing, obtain and document all necessary details and develop a user friendly village wise map showing the fields assigned to BMP cotton	Cotton growers	Indus for All (WWF-P)	-Agri. Dept. -Revenue staff	

Output No.	Output	Activity	Target Group	Responsible Organizations	Stake- holders	Assumptions/risks and mitigation strategies
4.	Inputs and technical support for BMP cotton growing provided to ES providers.	1. Arrange and supply of BMP seed and other inputs to BMP cotton growers 2. Provide a full time BMP expert during the full cotton growing season 3. Enhance capacity of BMP cotton growers with trainings and exposure visits 4. Arrange regular visits of the expert to the various BMP cotton growing areas and for meetings with the growers 5. Document and share the experiences among the cotton growers.	• Cotton growers	• Indus for All (WWF-P)	Agri. Dept.	It will be possible to generate funds and support the growers

Output No.	Output	Activity	Target Group	Responsible Organizations	Stake- holders	Assumptions/risks and mitigation strategies
5.	Agreement between BMP cotton growers/ sellers and buyers achieved regarding commitments.	Develop links; arrange and facilitate dialogue and negotiations between BMP cotton growers/sellers and buyers commitments regarding (1) compliance of ES regime by the growers & (2) purchasing cotton at premium price or compensating the producers in any other form .	• Cotton growers/ ES providers • ES buyers	• Indus for All (WWF-P)	• Agri. Dept • Ginners and Textile Associations • Export Promotion Bureau.	Both ES providers & Buyers will agree on a reasonable arrangement.
6.	Compliance of Agreement by both parties achieved and sanctioning enforced in case of violation.	• Develop a suitable monitoring frame work • Implement the same in letter and spirit • Apply sanctioning in case of violations • Document and disseminate experiences and lessons learned for adjustments, and promoting scaling up and replication.	• Cotton growers/ ES providers • ES buyers	• Indus for • All (WWF-P) • Agri. Dept	• Ginners and Textile Associations • Export Promotion Bureau.	Compliance and monitoring, although difficult, will be possible with minimum need for sanctioning. Some flexibility will however be built in to accommodate genuine difficulties and adjustments

Output No.	Output	Activity	Target Group	Responsible Organizations	Stake- holders	Assumptions/risks and mitigation strategies
7.	Regulatory framework drawn up and implemented:	• identify funding sources • create and manage an ES fund/ a collection system for payments established • arrange signing of medium-term bilateral agreements/contracts with ES sellers at Chotiari and buyers in Sanghar District	• Cotton growers/ ES providers • ES buyers	• Indus for • All (WWF-P) • Agri. Dept • ES buyers	• District coordination committee (DCC)	• The ES buyers and ES sellers might be reluctant to contribute to the Fund. Initially, the fund may be created with contribution from government and donors.
8.	Management plan implemented		• Mainly ES sellers & buyers	• Mainly Indus for All/ • Agri. Dept. DCC	• DCC	• Funding is perhaps the main constraint, which will be resolved by submission of formal funding proposal to donors.

Output No.	Output	Activity	Target Group	Responsible Organizations	Stake- holders	Assumptions/risks and mitigation strategies
9.	A certification, monitoring and evaluation system for ES established and implemented	• Develop and implement a Certification System • Develop and apply an Efficiency Measurement System • Develop and implement a Monitoring & Evaluation System • Non-compliance and sanctioning	• Mainly ES sellers	• Mainly Indus for All/	• DCC	
10.	The ES system of the PES Scheme documented and disseminated.	• Document ,with analysis, the ES system of the PES scheme that will emerge • Disseminate for scaling up/replication in other areas	• ES sellers and buyers	• Mainly Indus for All/	• Agri. Dept. • DCC	

3. INPUTS (BUDGET)

The budget for 2010, for which funds will have to be generated is given in Table-2. This budget includes only the funds required for supporting the establishment of the PES Fund suggested in Section 2.5.1 and a part of the Fund as the major part of the Fund is expected to be contributed by the ES purchasers and sellers (for sustainability sake).

Table-2 : Budget of the PES Scheme for 2010

S.No	Head of Expenditure		Av./ Month (Rs.)	Annual/ Lump sum (Rs.)	Remarks, if any
I.	**Staff Salaries**				
1.	PES Program Coordinator				
2.	BMP Cotton Expert				
3.					
4.					
5.					
II.	**Staff Travel Expenses**				
III.	**Transport, Furniture and Equipment**				
1.					
2.					
3.					
4.					
5.					
6.					
IV.	**Operational Expenses**				
1.	Office building rental				
2.	Maintenance and running of vehicles				
3.	Maintenance and operation of furniture and equipment				
4.	Communication costs (telephone, cell phone, fax, DSL, Courier, post)				
5.	Stationary, photo copies, printing				
6.	Utility bills (power, gas, water)				
V.	**Output Wise Activities Expenditure**				
1.	Enhanced	• Disseminate the			

S.No	Head of Expenditure		Av./ Month (Rs.)	Annual/ Lump sum (Rs.)	Remarks, if any
	Awareness	results of PES Feasibility to: • Communities, especially cotton growers in the seven clusters of villages (dehs)			
		• Potential ES buyers			
		• Use the progressive growers in dissemination of results			
2.	Willingness of ES buyers obtained for premium price or other compensatory packages for ES providers	• Arrange dialogue and negotiations with the potential ES buyers.			
3.	BMP Cotton growing practices introduced and expanded on 500 ha in the Chotiari Reservoir Area.	• Obtain and review the revenue record of ownership/ share cropping of land, cotton growing areas, and irrigation sources for selecting the suitable cotton growing villages			
		• Prioritise the villages, specific lands and growers, using a criteria, for inclusion in the PES Plan			

S.No	Head of Expenditure		Av./ Month (Rs.)	Annual/ Lump sum (Rs.)	Remarks, if any
		• Arrange a comprehensive survey of the cotton fields assigned to BMP cotton growing,			
		• Obtain and document all necessary details and develop a user friendly village wise map showing the fields assigned to BMP cotton			
4.	Inputs and technical support for BMP cotton growing provided to ES providers.	• Arrange and supply of BMP seed and other inputs to BMP cotton growers			
		• Provide a full time BMP expert during the full cotton growing season			
		• Enhance capacity of BMP cotton growers with trainings and exposure visits			
		• Arrange regular visits of the expert to the various BMP cotton growing areas and for meetings with the growers			

S.No	Head of Expenditure		Av./ Month (Rs.)	Annual/ Lump sum (Rs.)	Remarks, if any
		• Document and share the experiences among the cotton growers.			
5.	Agreement between BMP cotton growers/ sellers and buyers achieved regarding commitments.	• Develop links; arrange and facilitate dialogue and negotiations between BMP cotton growers/sellers and buyers commitments regarding (1) compliance of ES regime by the growers &			
		(2) purchasing cotton at premium price or compensating the producers in any other form			
6.	Compliance of Agreement by both parties achieved and sanctioning enforced in case of violation.	• Develop a suitable monitoring frame work			
		• Implement the same in letter and spirit			
		• Apply sanctioning in case of violations			
		• Document and disseminate experiences and lessons learned for adjustments, and promoting scaling up and			

S.No	Head of Expenditure		Av./ Month (Rs.)	Annual/ Lump sum (Rs.)	Remarks, if any
		replication.			
7.	Regulatory framework drawn up and implemented:	• Identify funding sources	•	•	
		• Create and manage an ES fund			
		• Arrange signing of medium-term bilateral agreements/contracts with ES sellers at Chotiari			
8.	A collection system for payments established	• Develop and establish a collection system for payments			
9.	Management plan implemented	• Implement the management plan			
10.	A certification, monitoring and evaluation system for ES established and implemented	• Develop and implement a Certification System • Develop and apply an Efficiency Measurement System • Develop and implement a			
		• Monitoring & Evaluation System			

S.No	Head of Expenditure		Av./ Month (Rs.)	Annual/ Lump sum (Rs.)	Remarks, if any
		• Non-compliance and sanctioning			
11.	The ES system of the PES Scheme documented and disseminated.	• Document ,with analysis, the ES system of the PES scheme that will emerge			
		• Disseminate for scaling up/replication in other areas			