

Cost-benefit analysis for interventions supported by the Swiss Agency for Development and Cooperation (SDC) in Vietnam through the PSARD project

A project jointly implemented by agriculture and rural development authorities, and Helvetas



CBA of Road & Bridge, Hoa Binh Province

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 10	TOTAL
Normal value										
Benefits	-	10640000	10640000	10640000	10640000	10640000	10640000	10640000	8410669	178170669
Costs	23541337	802067	802067	802067	802067	802067	802067	802067	802067	31562006
Cash Flow	23541337	15837933	15837933	15837933	15837933	15837933	15837933	15837933	8602	146608663
Total discounted benefits		106783699								
Total discounted costs		-28469691								
Net Present Value (NPV) VND		78314008								
Internal Rate of Return (IRR), %		67%								
Discounted Benefit/Cost ratio		3.76								
Nominal Benefit/Cost ratio		5.68								
it details										
22 DC										
23 Investment	10419168									
24 Maintenance										
25 Total SDC spending	10419168									
26 overment										
27 Land used for infrastructure (sq.m)										
28 Material (cement, stones, etc.)										
29 Labour costs										

$$NPV = \sum_{t=0}^n \frac{(Benefits - Costs)_t}{(1+r)^t}$$

where:
 r = discount rate
 t = year
 n = analytic horizon (in years)

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Hanoi, August 2011

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Abbreviations

CB	Cao Bang Province
CBA	Cost benefit analysis
CDF	Commune Development Fund
DARD	Department of Agriculture and Rural Development (Province)
ETSP	Extension and Training Support Project for Forestry and Agriculture in the Uplands
FFS	Farmer Field School
HB	Hoa Binh Province
Hh	Household
MARD	Ministry of Agriculture and Rural Development
MARD / OPD	Ministry of Agriculture and Rural Development / Organisation and Personnel Department
ODA	Official Development Assistance
PMSU	Project Management and Support Unit
PPSG	Plant Protection Service Group
PSARD	Public Service Provision Improvement Program in Agriculture and Rural Development
SCBA	Social Cost Benefit Analysis
SDC	Swiss Agency for Development and Cooperation (in brief: Swiss Development Cooperation)
TOR	Terms of Reference
VSP	Veterinary service point

Acknowledgement

We would like to express our gratitude to SDC for this interesting and challenging mandate, Helvetas Hanoi for their hospitality and support, as well as all the stakeholders in Hoa Binh who patiently answered all our questions during the field trip.

Executive summary

Improving aid effectiveness – in line with the Paris Declaration (2005) and the Accra Agenda for Action (2008) – has become a crucial issue for development agencies. Therefore SDC decided to engage in a more systematic analysis of impacts and cost-effectiveness of its interventions. In Vietnam, the project PSARD implemented jointly by agriculture and rural development authorities, and Helvetas, was chosen as a pilot to do a cost – benefit analysis based on the performances of the first project phase (2008 – 2010). The model (ex-ante) is to be projected in the second project phase (2011 – 2015).

The mission of 10 days included a field visit of 3 days to Hoa Binh, where project partners could be interviewed and some examples of projects implemented with support of PSARD could be observed. Impact hypotheses were formulated, essentially based on the impact assessment report (2010). The methodology of CBA was applied as follows: in a first step, small projects supported by PSARD were clustered and for each cluster a CBA was calculated, excluding planning and overall project costs. Then all categories of projects were aggregated (weighted aggregation according to the financial volume of each project category) for both Cao Bang and Hoa Binh provinces. At this first level of aggregation, planning costs at provincial level were added. Finally, a complete aggregation of the two provinces, plus costs of the project support unit was done.

The main difficulty of the study resides in the fact that many assumptions had to be done due to the lack of quantitative information on impacts. The table of assumptions was done in a way that each variable (assumption) can be modified in the Excel model, showing how the revised assumptions impact on the model.

The overall result of the CBA model shows that the benefits of the project exceed the costs, with a calculated IRR of 17%, and a net present value of over 34 billion VND discounted at 10%. At the level of small infrastructure projects, the number of beneficiaries and the level of benefits per beneficiary is determinant for the profitability of the investments. In general, the profitability of Hoa Binh Province was substantially higher than that of Cao Bang Province under the same assumptions. The sensitivity analysis was done for three levels of discount rate (5%, 10% and 15%) as well as for increasing numbers of beneficiaries per project (- 10%; 0; +10%) and levels of benefit per beneficiary (- 10%; 0; +10%).

Due to the diversity of activities in the project, the overall CBA is rather stable. Important external factors such as market prices for agricultural commodities are only included indirectly in the model, by influencing the level of benefit per beneficiary.

The mission recommends applying the CBA model to PSARD phase 2, however only on the components for which the approach is meaningful (with clearly quantifiable impacts). This will require case studies to analyse impacts with appropriate methodologies. But the mission does not consider realistic to collect data on a large scale to verify the CBA model (too high M&E costs). It also underlines the risk that short term projects might be favoured over long term projects on the basis of the CBA results only. The CBA implementation during phase 2 will induce additional costs for the implementers of the project, which go clearly beyond the normal M&E costs. Therefore the mission recommends adequately considering these additional costs.

1 Introduction

Aid effectiveness and impact assessment

Improving aid effectiveness – in line with the Paris Declaration (2005) and the Accra Agenda for Action (2008) – has become a crucial issue for development agencies. Donors and partner countries committed themselves to deliver and account for development results at the country level, results that generate “real and measurable impacts”. To implement Paris Declaration in the specific context of Vietnam, the Government and donors worked together to prepare the Hanoi Core Statement on Aid Effectiveness (2006). SDC decided to engage in a more systematic analysis of impacts and cost-effectiveness of its interventions.

Measuring impacts using quantitative methods such as the cost-benefit analysis is a considerable challenge, especially when the projects to be analysed are complex and include a wide range of dimensions: economic, managerial, institutional, social, but also health-related and educational.

PSARD

SDC has supported the provincial governments of Cao Bang (CB) and Hoa Binh (HB), and MARD to implement PSARD for the first phase (2008-2010). The program aims to improve public service delivery in the Agricultural and Rural Development (ARD) sector with the overarching goal to improve the livelihoods of people in rural Vietnam. More specifically, the program purpose is “to contribute to building up efficient and effective decentralized public service delivery systems and processes in agriculture and rural development” through a pro-poor demand-led service provision particularly for farmers, ethnic minorities and women living in the upland areas and thus contributing to poverty reduction. After 3 years of implementation, the program has achieved some concrete results, which are considered convincing enough for SDC to continue to support for the second phase of four years to ensure sustainability. The project’s overall goal is “to contribute to province and district-wide mainstreaming of participatory local planning, financial decentralisation and improved public service delivery in agriculture, in order to reduce poverty and improve livelihoods in disadvantaged areas of HB and CB provinces”.

2 Objective of the study

From the Terms of Reference: “An ex-post cost-benefit analysis to be included in the end of phase II report is the objective. To prepare this, an ex ante cost-benefit analysis of the PSARD phase II will be done, using the costs incurred during Phase 1 (previous) and Phase 2 (current) and expected benefits. This will provide a) indications to the project implementers on items which provide most benefits and most costs, thus enabling an informed discussion and possibly make adjustments towards improving economic impact, and b) recommendations on data collection needs during Phase 2 to provide firmer basis for the ex-post analysis.

1. An economic ex ante analysis of the project Phase 1 + 2.
2. Condensing the most relevant information in
 - a. an excel spreadsheet, allowing the modification of assumptions and doing sensitivity analysis (e.g. separate sheet on assumption and questions of attribution)
 - b. explicit description of how the attribution to the project has been modeled
 - c. a succinct explanation of the underlying assumptions, easy to understand for a non-expert third party
 - d. containing at least calculations of the internal rate of return, net present value and discounted and nominal cost-benefit relations and other management ratios considered as relevant in the specific case
 - e. reasonable, plausible explanations concerning estimations (comprehensible for non-expert third parties)
 - f. interpretation and critical evaluation of the findings in 1-2 pages
3. Capacity Building of SDC staff and partners on how to use the outputs - if necessary
4. Recommendations to improve the project M&E systems for improved integration of economic and financial analysis concerns

3 Methodology

3.1 What is impact? and what about counterfactual?

The IFAD impact evaluation guidelines define impact as the “the attainment of development goals of the project or program, or rather the contributions to their attainment.” The ADB guidelines state the same point as follows: “project impact evaluation establishes whether the intervention had a welfare effect on individuals, households, and communities, and whether this effect can be attributed to the concerned intervention”.

With/without comparison		
	<i>With intervention</i>	<i>Without intervention (control group)</i>
Comparison of performances	The difference between the two groups is considered as the impact of the intervention	
Condition	Both groups must be equally eligible for the project interventions	

The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention. Counterfactual analysis is also called with versus without. This is not the same as before versus after, as the situation before may differ in respects other than the intervention. There are, however, some cases in which before versus after is sufficient to establish impact, this being cases in which no other factor could plausibly have caused any observed change in outcomes. The most common counterfactual is to use a comparison group. The difference in outcomes between the beneficiaries of the intervention (the treatment group) and the comparison group is a single difference measure of impact (see box). This measure can suffer from various problems, so that a double difference, comparing the difference in the change in the outcome for treatment and comparison groups, is to be preferred¹.

3.2 Cost benefit analysis

(Adapted from <http://www.sjsu.edu/faculty/watkins/cba.htm>)

Cost-Benefit Analysis (CBA) estimates and totals up the equivalent money value of the benefits and costs to the community of projects to establish whether they are worthwhile. These projects may be dams and highways or can be training programs and health care systems.

In order to reach a conclusion as to the desirability of a project all aspects of the project, positive and negative, must be expressed in terms of a common unit; i.e., there must be a "bottom line." The most convenient common unit is **money**. This means that all benefits and costs of a project should be measured in terms of their equivalent money value. A program may provide benefits which are not directly expressed in terms of dollars but there is some amount of money the recipients of the benefits would consider just as good as the project's benefits. (...)

Not only do the benefits and costs of a project have to be expressed in terms of equivalent money value, but they have to be expressed in terms of dollar of a **particular time**. A dollar available five years from now is not as good as a dollar available now. This is not because of the effect of inflation, but because a dollar available now can be invested and earn interest for five years and would be worth more than a dollar in five years. If the interest rate is r then a dollar invested for t years will grow to be $(1+r)^t$. Therefore the amount of money that would have to be deposited now so that it would grow to be one dollar t years in the future is $(1+r)^{-t}$. This is called the discounted value or present value of a dollar available t years in the future.

When the dollar value of benefits at some time in the future is multiplied by the discounted value of one dollar at that time in the future the result is discounted present value of that benefit of the project. The same thing applies to costs. The net benefit of the projects is just the sum of the present value of the benefits less the present value of the costs.

The choice of the appropriate discounting rate is an important issue that will be discussed later (x.x).

¹ Impact Evaluation: The Experience of the independent evaluation group of the World Bank, OECD: Outline of principles of impact evaluation (undated) and other sources (see bibliography)

3.3 Financial vs. economic CBA

For obvious reasons, only the economic CBA will be applied here, as the projects analysed in this study reach far beyond the scope and interests of private investors. The economic analysis will inform about the benefits of the projects to the society, therefore this method is also called the social cost benefit analysis (SCBA). Moreover, “recognizing that CBA declines in importance as non-monetized social benefits increase, CBA is supplemented by a qualitative treatment of non-monetized benefits”². A useful link for non specialist readers who would like to learn more about cost-benefit analysis, with explanation about the difference between financial and economic analysis is the following: www.icra-edu.org/objects/francolearn/Anacoutbenecon.pdf

3.4 Sources of information

The information used for this study originates from a short field visit to Hoa Binh (see programme of the mission, annex 2), interviews with key informants from Helvetas (implementing agency) as well as from the following documents of PSARD phase 1 and phase 2:

1. PSARD Phase 2 Project Document 2011-2015
2. Satisfaction survey report 2010
3. Current M&E system
4. PSARD Phase 1 2008-2010 final report
5. CDF impact assessment
6. Various M&E documents

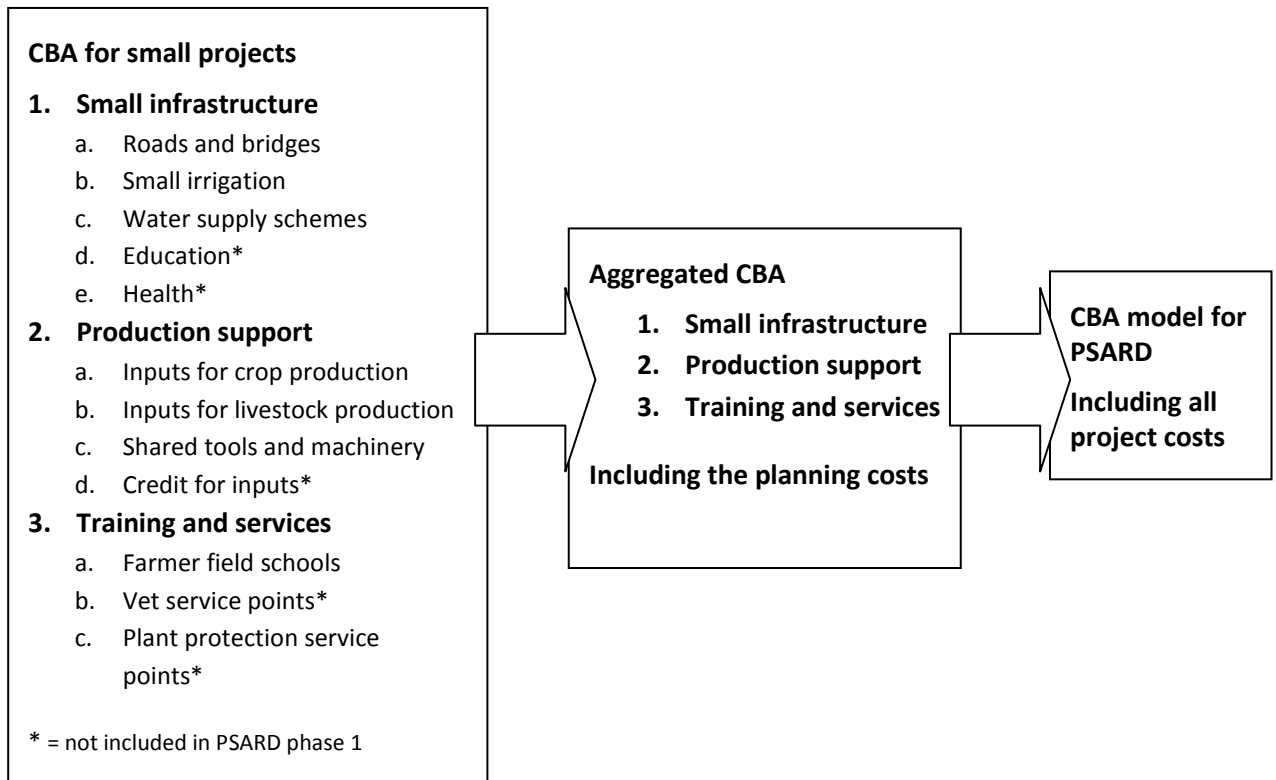
3.5 System boundaries of the CBA for PSARD

The first methodological difficulty that needed to be clarified when starting the analysis was the definition of the analytical framework. What is the object of the cost benefit analysis? How do we delimitate the costs and which benefits should we consider?

After the initial working sessions with the project team and study of the main documents, the analytical framework was defined as follows:

- a. The small projects implemented through the CDF were to be clustered and analysed by category (i.e. by nature); this is because the wide range and diversity of projects does not allow to develop a meaningful single model
- b. In a first step, the analysis should consider the costs of the investment at commune level (contribution from CDF, from the community and public funds) while the benefits would include the totality of additional benefits (comparing with the situation without the project)
- c. In a second step, the management fees at commune level would be added as these costs need to be allocated (proportionally) to reflects the real situation
- d. Then in a third step, the projects were to be aggregated in larger categories: small infrastructure, production support and training&services.
- e. Finally, an even larger aggregation would lead to a “single PSARD CBA model”, including all the costs of the project; the costs of planning (SEDP) would be included only at that level, as it is difficult to include them for reasons of allocation.

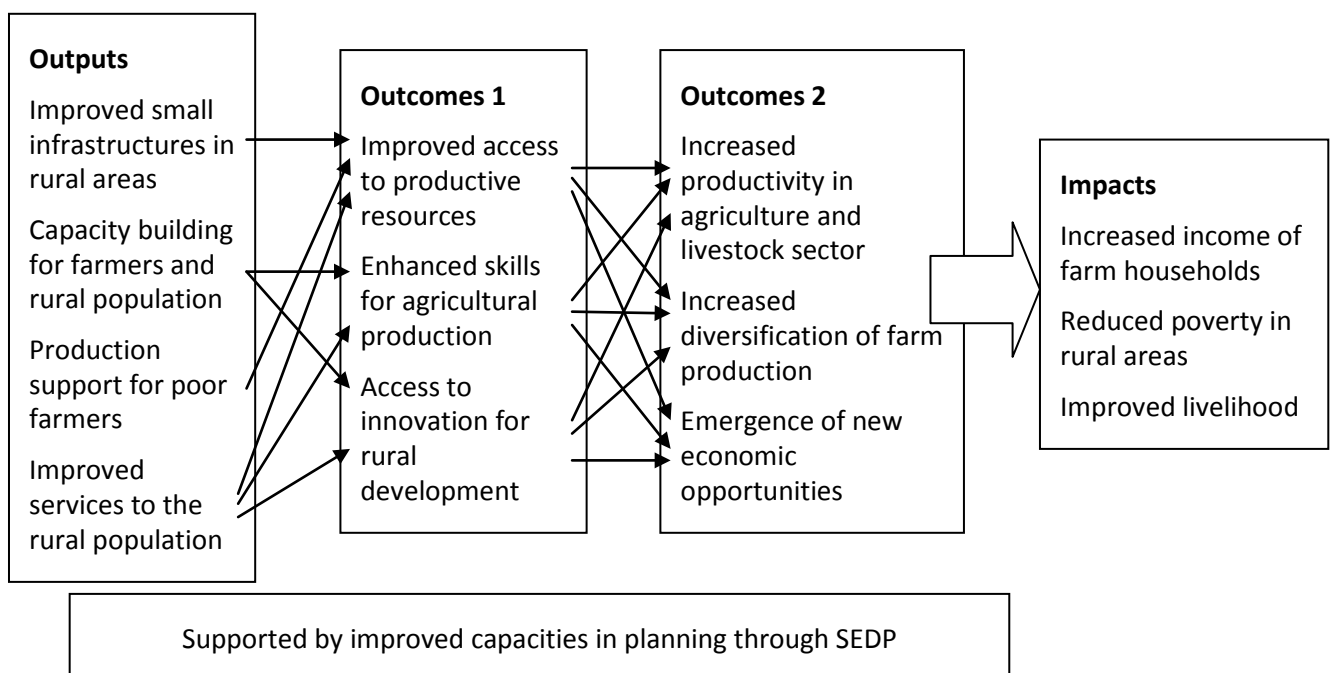
² SOCIAL AND ECONOMIC COST-BENEFIT ANALYSIS of RURAL MAINTENANCE PROGRAMME IN BANGLADESH Ashraf Uddin Chowdhury, Abul Barkat, Avijit Poddar, Murtaza Majid, Nazme Sabina, Matiur Rahman, Saiful Hoque. Human Development Research Centre (HDFRC), RMP, Care, 2006



The CBA will be calculated based on the costs and benefits during phase 1. For those projects that were not included in phase 1, CBA models will be developed based on assumptions.

3.6 Impact chains: how to allocate benefits?

The benefits of the small projects implemented through PSARD are manifold. The following sketch is an attempt to illustrate the situation of PSARD. Besides the lack of solid quantitative information about benefits, another issue is proper allocation to interventions and policies. We will discuss benefits and their attribution for each small project category in chapter 5.



The central group of objectives of PSARD is linked with participatory planning and capacity building in (financial) management (partly outcomes 1 and 3). However, few of the indicators related to these elements are directly usable for a CBA. This is due to the fact that these outcomes are only contributors to the main objective of poverty reduction and livelihood improvement. If better planning leads to more efficient implementation of projects (such as CDF) then these activities shall have share of the benefits.

Quantitative benefits of projects depend mainly on two factors: the number of beneficiaries on the one hand, and the additional gain per beneficiary that can be attributed to the project on the other hand.

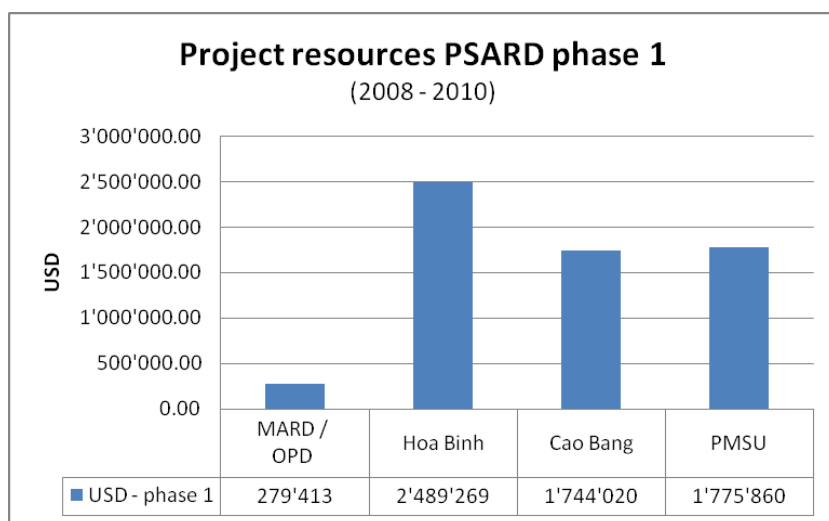
In the case where several small projects were combined in the same village (apparently this was the case in many places) the specific benefit of each intervention should be assessed in order to avoid any double accounting. Example: if a small irrigation system allows a productivity increase of 60% and at the same time the farmers group benefitted from a FFS, the gain of which is estimated to be 20% increase in productivity, the question will be how much is the real gain in productivity. If it is less than 80% (total of the two gains) then the attribution should be made proportionally unless other information is available to make it more accurate.

3.7 Different comparisons of projects

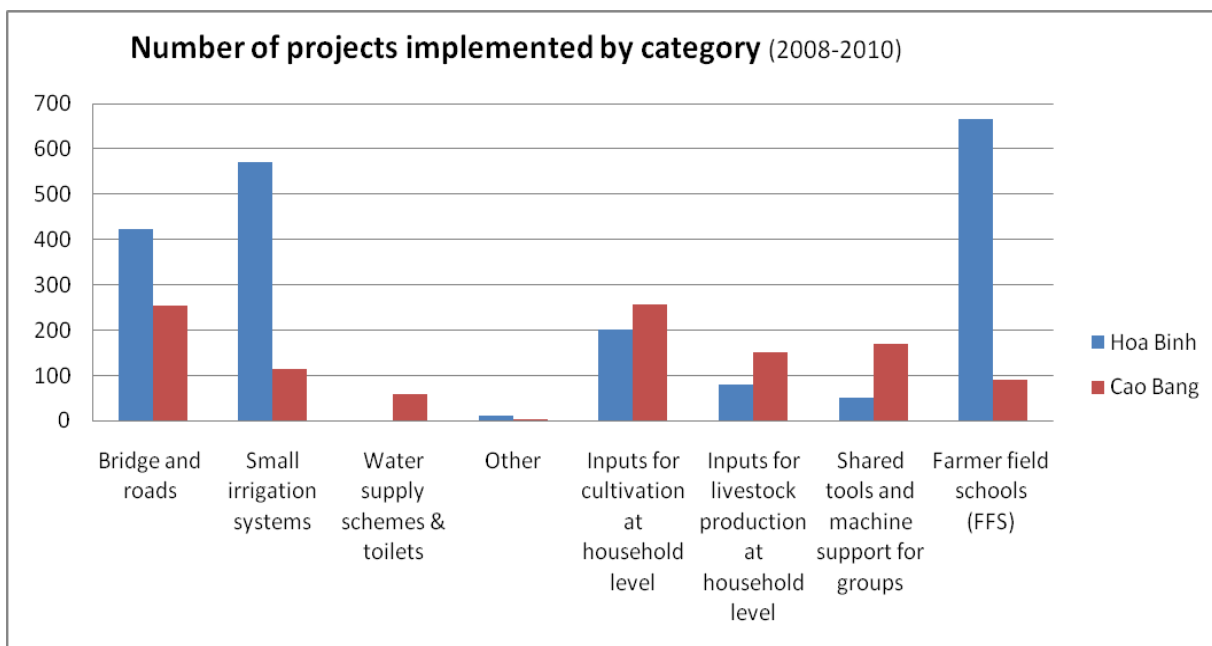
With the CBA the projects under PSARD can be compared in different ways. Firstly, the performance of both provinces can be compared, under the same set of assumptions. Then we can compare the different categories of projects against each other (this is again very much dependent on the assumptions) and finally the projects can be compared within a category (this will be possible if CBAs are done in some specific projects, e.g. comparing two small irrigation schemes in the same province).

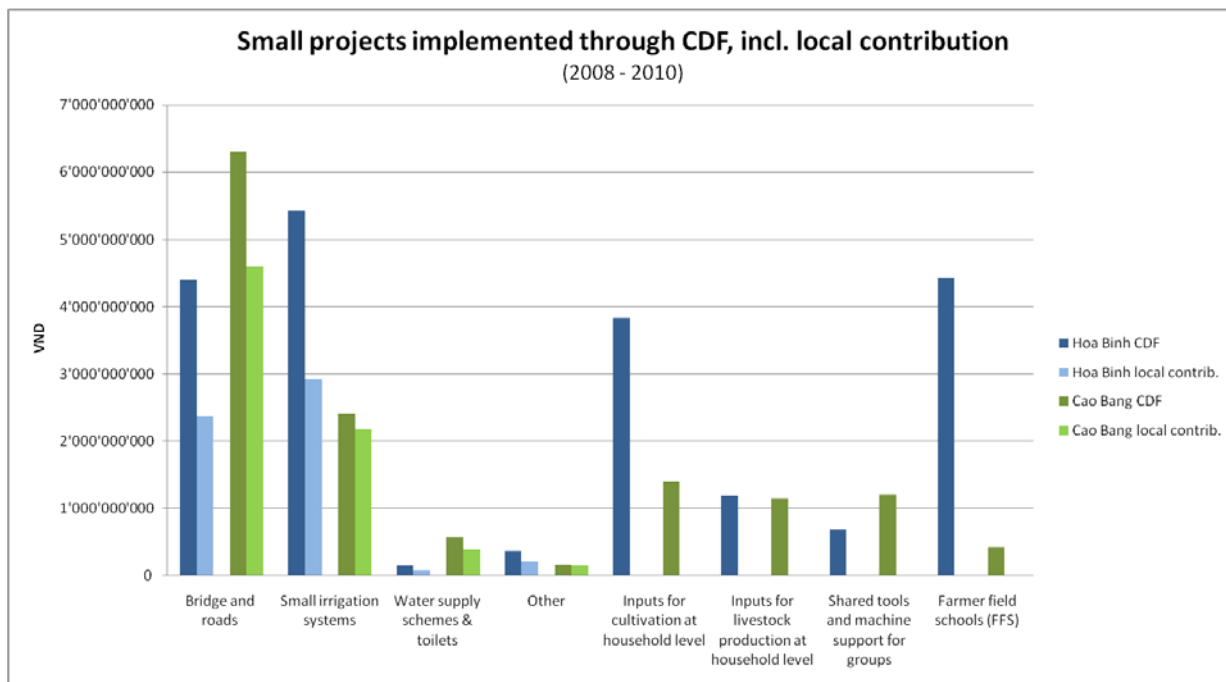
4 Analysis of PSARD phase 1

During its initial phase of 3 years, PSARD has spent a total of USD 6.28 million USD (see graph below) of which 39.6% went to Hoa Binh Province, 27.7% to Cao Bang, and 4.4 % to MARD / OPD while the project management and support unit used 28.2% of the resources.



Within the two provinces of Hoa Binh and Cao Bang, the resources were spent as follows: 677 projects for bridges and roads, 685 projects dealing with small irrigation (of which a vast majority in Hoa Binh), 756 Farmers Field Schools (again the great majority in Hoa Binh). Inputs for production support (in general free inputs for poor households) were in majority supplied in Cao Bang. Altogether more than 1'600 projects were implemented. In terms of financial resources, the funds were allocated to these categories as follows:





On this graph we can see that local contributions were obtained only for small infrastructure projects, while the other project categories (inputs and training) were funded exclusively through CDF funds. The amount of local contributions was substantial, ranging from 50% to almost 100% of the CDF resources; however these local resources were usually in kind (mainly in form of labour).

Field trip: assessment of CDF activities during PSARD phase 1

During our visit to the field in Hoa Binh, we proposed a short assessment exercise to the PSARD stakeholders of the District of Tan Lac. The result is displayed on the right.

According to their evaluation, “roads and bridges” have the highest potential in terms of number of beneficiaries (1st column), gain in productivity / income (2nd column), and social benefits (3rd column). The second highest mark was given to small irrigation projects, and the third was Farmers’ Field School for livestock. On the other end, poor marks were given to VSP (veterinary service points), because they said that private providers were already available, free supply of inputs (no impact, 5th line), machinery (next line) and PPSG (plant protection service points, last line). The mark given in the middle corresponds to the multiplication of number of beneficiaries by gain per beneficiary, which is an indicator for project benefits for the users.

Cơ sở hạ tầng	Số người hưởng lợi	Sản lượng tăng thêm	Lợi ích xã hội
Đường + Cầu	3.2 2.2 1	2.2 3.1 4	2.2 2.1 1.9
Thủy lợi	2.2 2.3 1.2	3.2 4.2 2	3.2 2.2 2.1
Giáo dục	3.3 1.2 2.2	3.3 6.4 3.4	3.3 2.2 2.4
Y Tế	3.2 1.2 2	4.3 3.4 2.3	2.2 1.2 3 2
Hỗ trợ sản xuất - Thuốc sâu + giống	2.4 4.2 3.4	3.1 9 2.3	3.3 3.3 4.5 3.3
- Máy móc	3.3 3.3 3.4	3.1 7.8 2.3	3.3 2.3 4.5 3.1
- Tin dùng	2.2 3.3 3	3.2 2.3 2.3	3.2 2.2 3.4 2.3
Tập huấn			
FFS Chăn nuôi	2.2 2.2 3	2.1 4.4 3.2	2.2 3.2 2.3
FFS Cây trồng	2.3 2.2 3	2.2 2.3 2.8	3.3 2.2 3 2.6
VSP - Điện thú y	3.3 3.3 3.4	3.1 9.5 3.4	3.3 3.3 3 3
PPSG - Bảo vệ thực vật	2.3 2.3 3.4	2.6 7.8 3	3.3 1.2 3 2.4

1 = Cao nhất 2 = Cao 3 = trung bình 4 = thấp 5 = Rất thấp.

5 CBA calculation results

5.1 Projects at commune level

Below each project category is described with its costs and assumed benefits. We will make a comment here about the costs and the benefits that are applicable to all the cases that are exposed hereafter.

The costs include all the costs paid through the CDF as well as the contributions of the local communities. However, these are not yet the total costs: the costs of capacity building in financial management and the planning costs are not yet included. Moreover, a share of the project management and support unit should also be included. These additional costs will be added in the next steps of the analysis (aggregation of data by category) and total CBA for PSARD (adding PMSU).

The question remains how much of these benefits (assuming they can be demonstrated in a quantitative way) can be

attributed to the project alone, as we know that the Government investments in rural infrastructures are considerable. In the following CBA model, we chose to keep the gains in each project low and to attribute 100% to PSARD rather than estimating the gains higher and estimating a share for PSARD. The end result should be the same!

There is a big uncertainty about the real benefits. Another way of addressing the issue of benefits would be to fix an objective in terms of profitability (e.g. IRR = 5%) and to see with the model what would be the minimum benefit needed to reach this objective. By any means, there is a need to verify in the field – through specific case studies – whether and under which conditions these objectives can be met.



Bridge in Tan Lac District, constructed with CDF funds and contribution from the local community; this bridge gives access to 50ha of irrigated land. Without the bridge, the people had to travel almost 2 km to reach the fields. With the bridge, they can bring more fertilizers to the field; they can use machines for the cultivation. These benefits (intensification of the cropping system) were quantified as follows: the bridge is used by 2 villages, benefitting 120 households. The intensification of paddy production resulted in a yield increase from 4.5 – 4.6t/ha and per crop before the project to 5.2t/ha with the project (2 crops = 10.4 t /ha and per year). But how much of this gain can be attributed to the bridge alone? Some of the farmers benefitted from free inputs, they introduced the SRI technique for paddy cultivation (training from extension service) and they applied lime.

5.2 Impact assumptions

In the following table, we list the assumed impacts that can be attributed to the PSARD funding only, based essentially on information obtained from the impact assessment report and our field visit.

Table of assumptions regarding impacts

		Assumptions for Hoa Binh						Assumptions for Cao Bang						
	Unit	Road & Bridge	Irrigation	Clean Water	Shared Machines	Farmer Field School	Service point	Road & Bridge	Irrigation	Clean Water	Shared Machines	Farmer Field School	Service point	
Number of sub-project*	Unit	422	572	...	52	666	...	255	113	59	169	90	...	
Average number of beneficiaries per sub-project*	Household	64	84	...	75	42	...	38	34	15	27	39	...	
Area of land used	m2	500	500	30				500	500	30				
Price agric. Land*	VND/m2	15'000						10'000						
BENEFITS														
Improved live-stock compared to without project	VND/hh/year				300'000	300'000				200'000	200'000			
Improved cultivation compared to without project	VND/hh/year	100'000	100'000		170'000	20'000	20'000	80'000	100'000		170'000	20'000	20'000	
Rate of success farmer after FFS	%				25%							25%		
Improved health leading to reduction of sick leave	Day/person	1			3				1			3		
Reduced transport cost	VND/hh	240'000							240'000					
Time saved	days/hh/year			36						36				
Improved school attendance leading to better jobs in future	VND/hh after X years	Related to possible new projects in education funded through CDF in phase 2, expected impact after 20 years					Related to possible new projects in education funded through CDF in phase 2, expected impact after 20 years							

* Not assumptions for phase 1 but these parameters would become assumptions in phase 2.

** Assumption on price of agricultural land: we take the least price of annual crop land in rural disadvantaged areas.
Decision of Cao Bang People's Committee No.3165 in 2009 issuing prices of land in Cao Bang province since 2010, Decision of Hoa Binh People's Committee No.40 in 2009 regulating prices of land in Hoa Binh province since 2010

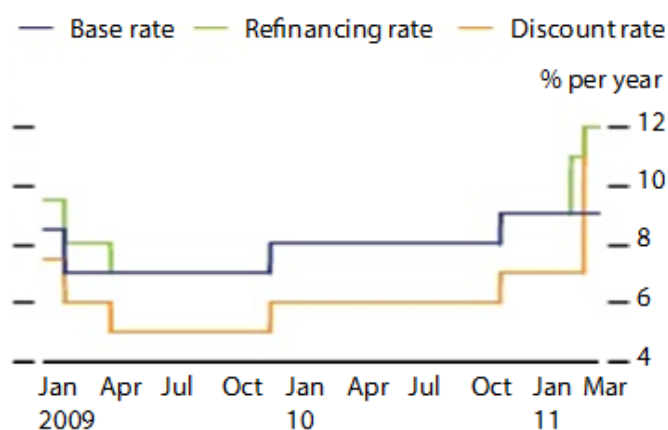
The table is based on phase 1 and needs to be adapted for PSARD phase 2.

Explanations

The assumptions of the table above are combined with a more general set of assumptions applicable to the entire project:

Discount rate	10%
Residual value of infrastructure at year 10	10%
Daily wage for unskilled labour, VND	30'000
Maintenance costs, % of investment costs	5%
Number of persons per household	4
Number of adults per household	2

- A **discount rate** of 10% was selected based on information from the Central Bank of Vietnam and information from ADB. The graph on the right shows that the rates indicated by the banks (base rate, refinancing rate and discount rate) have fluctuated strongly since 2009. The rate was lowest between April and October 2009 (5%) but then increased



Source: State Bank of Viet Nam.

gradually to reach 12% and even 13% since May 2011 (State Bank of Vietnam). But as PSARD being a social project, and the aim of which is poverty reduction, livelihood improvement and increased income for rural citizens.

- **Residual value and maintenance of infrastructure:** as most small infrastructures are rather light constructions, we did not want to allocate a too high residual value. However we added a yearly amount of 5% for maintenance, which is often not done in rural Vietnam.
- **Daily wages of unskilled labourers:** it was reported that unskilled labourers are paid at least 75'000 to 100'000 VND / day. However, job opportunities do not occur all the time, therefore the opportunity costs of labour should not be estimated higher than 30'000 VND (which corresponds to the official poverty line in Vietnam³). In reality it could even be lower at times throughout the year.
- **Household size:** along with the assumption on daily wages, the household size was estimated to be 4 persons, 2 adults and 2 children. If the two adults have to feed the two children, then they need an income (cash, kind or combined) of at least 800'000 VND each per month, which corresponds more or less to 30'000 VND per day (1.5 USD).

5.2.1 Small infrastructure project (roads and bridges)

Costs

The category "roads and bridges" included 677 projects in the first phase of PSARD. In average, a typical project of this category cost 26 million VND out of which 60% were funded from CDF. The average number of beneficiaries per project was 54. There are substantial differences between Hoa Binh and Cao Bang, as the average funds per project were more than double in Cao Bang while the number of beneficiaries was lower.

Characteristics of "roads and bridges" projects

	Number of projects	CDF funds	Local contributions	Number of beneficiaries (households)	Average funds per project	CDF share	Beneficiaries (households) per project
Hoa Binh	422	4'396'888'818	2'372'555'547	26'915	16'041'337	65%	64
Cao Bang	255	6'297'864'027	4'603'524'629	9'573	42'750'544	57%	38
Total	677	10'694'752'845	6'976'080'176	36'488	26'101'674	60%	54

³ 400'000 VND per person and per month in rural areas, applied since January 1st 2011.

Benefits

The benefits will first be analysed qualitatively before we attempt to quantify them. Roads and bridges projects have been reported to have the following benefits for the users:

- Reduced time of transport for goods (e.g. access to market)
- Reduced time for access to the field
- Reduced time for access to services (health and education, communication)
- Gain in agricultural productivity (e.g. if access to the field was improved, allowing for instance to bring more fertilisers and pesticides to the field, or access to the field with machines, or cropping intensification, or change of crops for more profitable ones, etc.)

The benefits of the project will be calculated based on the number of households benefitting from the project and the average gain per household. In this case we have the following results:

Benefits from “roads and bridges” projects (theoretical example based on data from the impact assessment report, Ageless, 2010)

		Hoa Binh	Cao Bang	Average
	Number of beneficiaries (per project)	64	38	54
Average gain per household [VND]	Estimated benefits per household from agriculture			
	Reduced costs			
	Transport to the market	240'000	240'000	140'000
	Increased costs for production			
	Intensification	-100'000	-100'000	-100'000
	Increased productivity			
	Increased output value	200'000	180'000	190'000
	Estimated benefits per household non-agriculture			
	Access to health care	30'000	30'000	60'000
	Access to education
	TOTAL benefits per household	370'000	350'000	360'000
	TOTAL benefits per project	23'680'000	11'400'000	19'440'000

The results (given here as an example from the Excel model) based on the set of assumptions (table in chapter 5.2) give the following results:

Roads and bridges	Hoa Binh	Cao Bang
Net Present Value (NPV) VND	158'208'538	29'683'816
Internal Rate of Return (IRR), %	105%	23%
Discounted Benefit/Cost ratio	5.56	1.49
Nominal Benefit/Cost ratio	8.19	2.16

Interpretation

The highly positive NPV for both Hoa Binh and Cao Bang are satisfactory. The performance in Hoa Binh is significantly better than Cao Bang because of the larger number of beneficiaries and the lower average investment costs. The natural conditions are different in Cao Bang, where the environment is less favourable, the population density is lower and the costs of investment are higher (mainly due to more difficult access and terrain).

Sensitivity analysis see chapter 6.

5.2.2 Small scale irrigation projects

Costs

The category “small scale irrigation” included 685 projects in the first phase of PSARD. In average, a typical project of this category cost 18 million VND out of which 60.5% were funded from CDF. The average number of beneficiaries per project was 75. There are substantial differences between Hoa Binh and Cao Bang, as the average funds per project were almost triple in Cao Bang while the number of beneficiaries was much lower.

Characteristics of “small scale irrigation” projects

	Number of projects	CDF funds	Local contributions	Number of beneficiaries (households)	Average funds per project	CDF share	Beneficiaries (households) per project
Hoa Binh	572	5'426'621'020	2'928'197'718	47'779	14'606'326	65%	84
Cao Bang	113	2'409'385'508	2'183'150'865	3'852	40'641'915	52%	34
Total	685	7'836'006'528	5'111'348'583	51'631	18'901'248	60.5%	75

Benefits

The benefits will first be analysed qualitatively before we will make an attempt to quantify them. Small scale irrigation projects have been reported to have the following benefits for the users:

- Expanded irrigated area
- Intensification of the cropping system
- Increased surpluses for marketing
- Increased production for own consumption

The benefits of the project will be calculated based on the number of households benefitting from the project and the average gain per household. In this case we have the following results:

Benefits from “small scale irrigation” projects (theoretical example based on data from the impact assessment report, Ageless, 2010)

		Hoa Binh	Cao Bang	Average
	Number of beneficiaries (per project)	84	34	75
Average gain per household [VND]	Estimated benefits per household from agriculture			
	Increased costs			
	More seeds and inputs needed	-100'000	-100'000	-100'000
	More labour for production and harvesting	-200'000	-200'000	-200'000
	Increased machine costs	-100'000	-100'000	-100'000
	Increased productivity			
	Increased output value	700'000	700'000	700'000
	TOTAL benefits per household	300'000	300'000	300'000
	TOTAL benefits per project	25'200'000	10'200'000	22'500'000

Small scale irrigation	Hoa Binh	Cao Bang
Net Present Value (NPV) VND	25'872'854	-35'477'042
Internal Rate of Return (IRR), %	33%	-12%
Discounted Benefit/Cost ratio	1.97	0.39
Nominal Benefit/Cost ratio	2.93	0.58

Interpretation

The situation in Hoa Binh is satisfactory, even if not very profitable (because this CBA does not include planning and management costs) on the basis of our assumptions (table in chapter 5.2). In Cao Bang, the situation is negative, which tends to show that the investment is not worthwhile or that our assumptions are too low. The main explanation for the poor result of Cao Bang is again the higher costs of investment and the lower number of beneficiaries. The topography of Cao Bang certainly explains to a large extent the difference in results.

Sensitivity analysis see chapter 6.

While computing the data for Cao Bang, we obtained a positive IRR (+10%) by considering only the SDC investment (in this case the local contribution is free) and by cutting the maintenance costs (which is not sustainable).

5.2.3 Water supply schemes and toilets

Costs

The category “water supply schemes and toilets” included 59 projects in the first phase of PSARD. In average, a typical project of this category cost 16 million VND out of which 59% were funded from CDF. The average number of beneficiaries per project was 15. Water supply schemes and toilets were only implemented in Cao Bang during the first phase, but it could be that some projects of this category would be implemented in the second phase in Hoa Binh as well.

Characteristics of “water supply scheme and toilets” projects

	Number of projects	CDF funds	Local contributions	Number of beneficiaries (households)	Average funds per project	CDF share	Beneficiaries (households) per project
Hoa Binh	0	0	0	0	0	0	0
Cao Bang	59	566'172'800	385'755'062	890	16'134'371	59%	15
Total	59	566'172'800	385'755'062	890	16'134'371	59%	15

Benefits

The benefits will first be analysed qualitatively before we will make an attempt to quantify them. Water supply schemes and toilets projects have been reported to have the following benefits for the users:

- Improved hygiene
- Time saving for collecting water
- Reduced water transmitted diseases = gain of labour days (better health)
- Water savings

The benefits of the project will be calculated based on the number of households benefitting from the projects. It is even more difficult here to quantify the benefits as the impact chain (linking outputs to impacts) is less direct compared to the first two categories of projects.

Benefits from “clean water and toilets” projects (theoretical example based on data from the impact assessment report, Ageless, 2010)

	Cao Bang
Number of beneficiaries (per project)	15
Increased benefits	
Time saved for water fetching (36 days per household per year)	1'080'000
Better health = working days available for income generation	90'000
Benefit per household	1'170'000
Benefits per project per year	17'550'000

Clean water and toilets	Cao Bang
Net Present Value (NPV) VND	91'402'782
Internal Rate of Return (IRR), %	107%
Discounted Benefit/Cost ratio	6.56
Nominal Benefit/Cost ratio	10.68

Interpretation

The project category is very profitable with an IRR of more than 100%. This may be due to a rather optimistic estimation of benefits (36 days per household as time saving) and this time saved is not necessarily converted into cash. However saved time in economic terms corresponds also to improved livelihood.

Sensitivity analysis see chapter 6.

5.2.4 Input supply (production support)

No cost benefit analysis was done for this activity because the method of input-output comparison would be more adapted here (project duration is not relevant as the activity consists in supplying inputs free of cost to poor households).

Expenditures for agricultural inputs support in Cao Bang and Hoa Binh

		Number of projects	CDF funds	Local contributions	Number of beneficiaries (households)	Average funds per household	CDF share
Cao Bang	Inputs for agriculture	257	1'396'292'400	0	5'220	267'489	100%
	Inputs for livestock	151	1'147'120'000	0	2'121	540'839	100%
Hoa Binh	Inputs for agriculture	201	3'836'781'258	0	18'353	209'055	100%
	Inputs for livestock	81	1'195'464'173	0	4'879	245'022	100%
Total	Inputs for agriculture	458	5'233'073'658	0	23'573	221'994	100%
	Inputs for livestock	232	2'342'584'173	0	7'000	334'655	100%

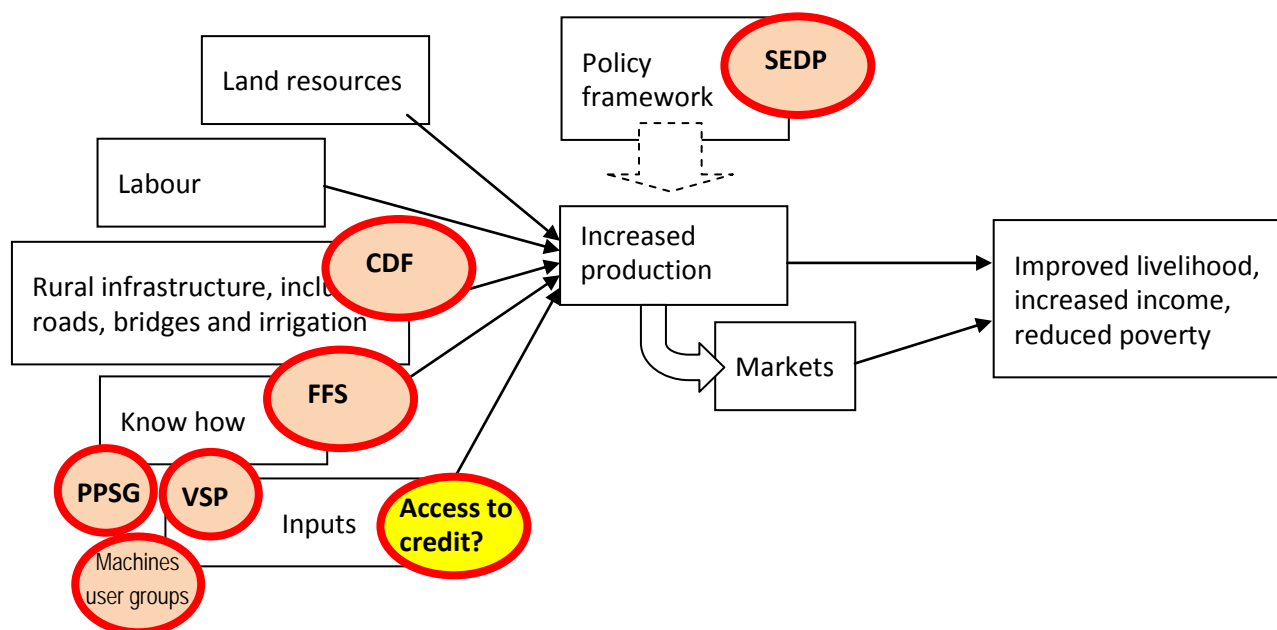
The inputs supplied are mostly consumables that are used immediately, and have hardly a long term perspective (hybrid seeds, fertilisers) and in the livestock sector mainly chickens and pigs mostly for fattening, i.e. all short term activities.

As it was decided by the project to discontinue the free distribution of inputs in the second phase, we did not further analyse this activity in terms of benefits.

Alternative to access to inputs

Access to productive inputs remains a key constraint of many farmers in rural areas of Vietnam. We therefore suggested analysing briefly – as an alternative to free distribution of inputs – access to financial services for farmers (e.g. micro-finance for agricultural inputs), however without making any concrete suggestion on who should do it and what the modalities should be⁴.

⁴ However ruling out that the project itself should engage in microfinance activities, rather operations through a local implementing agencies such as the women's unions



Credit for agricultural inputs?

With a capital of almost 8 billion VND (= 400'000 USD), an amount that corresponds to what was spent during phase 1 for free inputs supply, microcredit for crops and livestock production based on market rates and conditions (as the interest rate of credit is rarely the key for farmers' decisions but rather availability) could generate more additional growth in the agricultural sector than the free distribution of inputs (what is free has no value!).

At current rates, and assuming reasonable interest rates and conditions for microcredit it would be possible to supply on a credit basis up to 1'000 tonnes of NPK fertilisers or corresponding quantities of improved seeds each year. This would have a more sustainable impact on agricultural development than the supply of free inputs. With a well functioning microfinance partner (management and transaction costs of less than 1% = < 80 million VND). One may argue that poor households may not have access to this credit. This all depends on the modalities of the programme, there are projects in other parts of the world that are especially designed to benefit the poor through credit. Again we are not suggesting that the project should engage in revolving funds, but it may be worthwhile looking into possibilities to develop partnerships with existing microfinance institutions, or institutional partners such as the women's union.

5.2.5 Shared machinery groups (production support)

Expenditures for shared machinery and tools in Cao Bang and Hoa Binh

	Activity	Number of projects	CDF funds	Local contributions	Number of beneficiaries (households)	Average funds per household	CDF share
Cao Bang	Shared tools and machine support for groups	169	1'205'173'000	0	4'519	266'690	100%
Hoa Binh		52	690'391'000	0	3'896	177'205	100%
Total		221	1'895'564'000	0	8'415	225'260	100%

This activity aims at giving access to farm equipment and machinery for those who don't have access or to reduce the costs for those who do have access.

Benefits

The benefits expected are improved productivity, reduced post harvest losses, etc. For the CBA model we assumed a net income gain per household and per year of 170'000 VND. This modest increase should in reality be achieved or exceeded by a majority of farmers.

Shared machinery and tools	Hoa Binh	Cao Bang
Net Present Value (NPV) VND	61'469'866	19'195'977
Internal Rate of Return (IRR), %	91%	59%
Discounted Benefit/Cost ratio	4.54	3.07
Nominal Benefit/Cost ratio	6.46	4.38

Interpretation

With an IRR of almost 100% in Hoa Binh and 60% in Cao Bang, under the given assumptions the project is very profitable. The impact assessment report contains some information on the conditions of this kind of projects and under which circumstances the poor also can benefit from this activity.

Sensitivity analysis see chapter 6.

5.2.6 Farmer Field Schools (FFS)

Expenditures for FFS in Cao Bang and Hoa Binh

	Activity	Number of projects	CDF funds	Local contributions	Number of beneficiaries (households)	Average funds per household	CDF share
Cao Bang	FFS	90	419'881'000	0	3'472	120'933	100%
Hoa Binh		666	4'426'129'582	0	27'700	159'788	100%
Total		756	4'846'010'582	0	32'172	150'628	100%

Farmers Field Schools in Vietnam are a combination of “real FFS” and classic extension activities with demonstrations. Together with the FFS there were also study tours that are also included in the above costs.

Benefits

There is an abundant literature on the impacts of agricultural extension activities, including FFS⁵. It is generally very difficult to find evidence for direct impact, as there is a long path between training / capacity building and a change in practices at farm level that leads to increased production and productivity. It is also well known that it is very difficult to make extension systems sustainable because farmers' willingness to pay for advice is generally limited while costs of extension systems are usually rather high.

In the context of rural Vietnam, we have estimated that the benefits from FFS would be significantly higher for livestock activities than crops. We therefore estimated that farmers who would successfully apply what they learn in the FFS would generate 300'000 VND per year from livestock but only 20'000 VND from crops. In addition, we estimated that only 25% of all farmers participating in FFS would obtain measurable gains.

⁵ E.g. “Impact monitoring and evaluation system for farmer field schools in Kyrgyzstan: How to optimize resource allocation for higher impact” Irene Müller, Dominique Guenat and Ingrid Fromm, www.academicjournals.org/jaerd/PDF/Pdf%202010/.../Müller%20et%20al.p...

Farmers Field Schools	Hoa Binh	Cao Bang
Net Present Value (NPV) VND	2'591'200	323'072
Internal Rate of Return (IRR), %	14%	11%
Discounted Benefit/Cost ratio	1.14	1.03
Nominal Benefit/Cost ratio	1.70	1.52

Based on our assumptions, FFS is profitable both in Hoa Binh and in Cao Bang. The combination of technical improvements (such as small scale infrastructure) and production support (like FFS, access to inputs, etc.) is more likely to lead to sustainable improvement than FFS alone.

Sensitivity analysis see chapter 6.

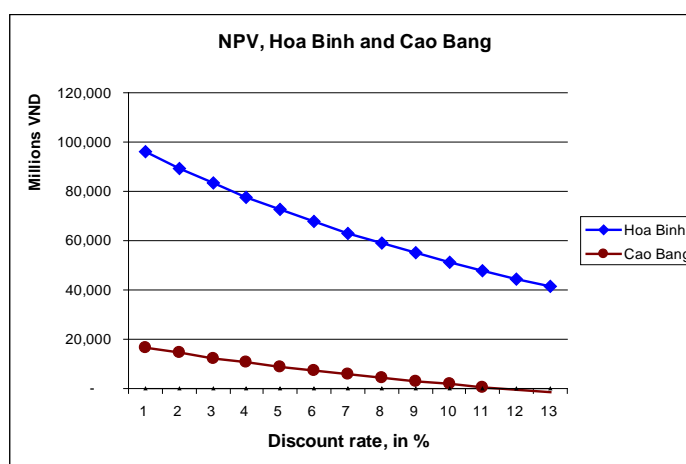
5.3 CBA aggregated by category and for PSARD

In chapter 5.2 we have presented the CBA for “average projects” at commune level by category. In section 5.3.1, this data is aggregated by category and by province while in 5.3.2 the data is aggregated at PSARD level, including all project costs.

5.3.1 CBA by category

		Hoa Binh	Cao Bang
Infrastructure	Net Present Value (NPV) VND	67,285,400,965	8,152,350,658
	Internal Rate of Return (IRR), %	63%	18%
	Discounted Benefit/Cost ratio	3.28	134.11%
	Nominal Benefit/Cost ratio	4.68	192.69%
Tools and machine support	Net Present Value (NPV) VND	3,196,433,034	3,244,120,185
	Internal Rate of Return (IRR), %	91%	59%
	Discounted Benefit/Cost ratio	4.54	306.82%
	Nominal Benefit/Cost ratio	6.46	437.65%
Services	Net Present Value (NPV) VND	1,725,739,214	29,076,448
	Internal Rate of Return (IRR), %	12%	9%
	Discounted Benefit/Cost ratio	1.14	102.51%
	Nominal Benefit/Cost ratio	1.70	152.13%
Planning and management (discounted)		9,117,106,054	7,100,884,682
TOTAL	Net Present Value (NPV) VND	63,090,467,159	4,324,662,610
	Internal Rate of Return (IRR), %	41%	12%
	Discounted Benefit/Cost ratio	2.22	1.13
	Nominal Benefit/Cost ratio	3.23	1.64

Overall, the CBA reveals the same tendencies by Province as for individual project categories above, i.e. that the context in Cao Bang is more difficult than in Hoa Binh. However, with the still clearly positive NPVs and rather good IRR there are good reasons to be optimistic about the project.



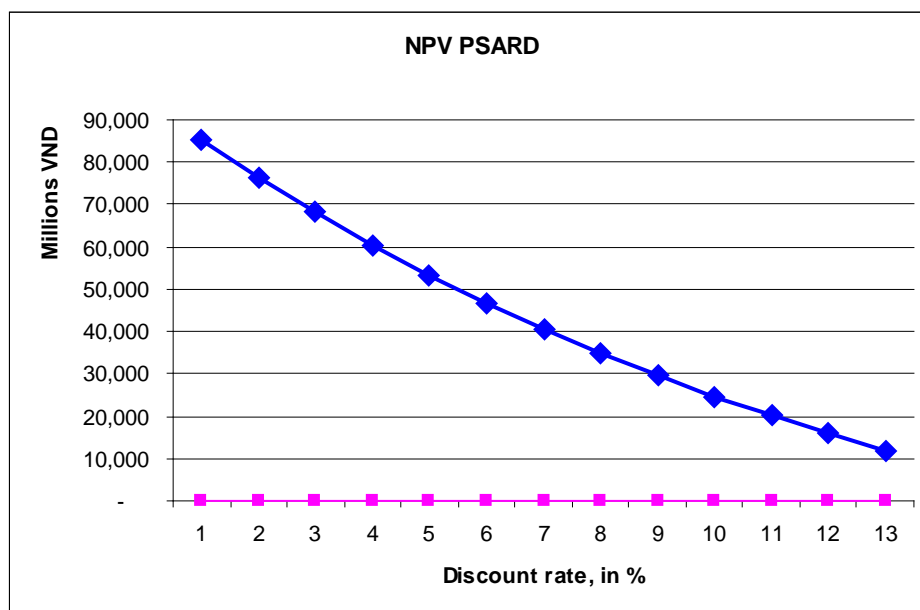
5.3.2 CBA for PSARD

The overall model for PSARD (based on phase 1 costs) shows a positive result with a positive NPV (at 10% discount rate) and an IRR of 17%. The sensitivity analysis is presented in chapter 6.1.

The inclusion of the PMSU costs is balanced by the good result of Hoa Binh province, while Cao Bang is also slightly positive (as seen in the previous chapter).

We should not forget that the CBA only considers quantified benefits, and not other benefits that represent an important share of the results of PSARD in terms of: improved capacities at government level (implementation of the project is done by the DARD of the two provinces, with support from Helvetas). The capacity building that is done (management, planning, participation, quality control, support and coaching of communes, etc.) are benefit that could not be quantified.

	unit	PSARD
NPV Hoa Binh Component (discounted)	VND	63,090,467,159
NPV Cao Bang Component (discounted)	VND	4,324,662,610
NPV PMSU costs (discounted)	VND	-32,500,223,624
NPV PSARD (discounted)	VND	34,914,906,145
Internal Rate of Return (IRR), %	%	17%
Discounted Benefit/Cost ratio	-	1.30
Nominal Benefit/Cost ratio	-	1.88



6 Sensitivity analysis and discussion

6.1 Sensitivity analysis

Users of the model can modify the assumptions (see chapter 5.2) and obtain more information on the model behaviour under different scenarios.

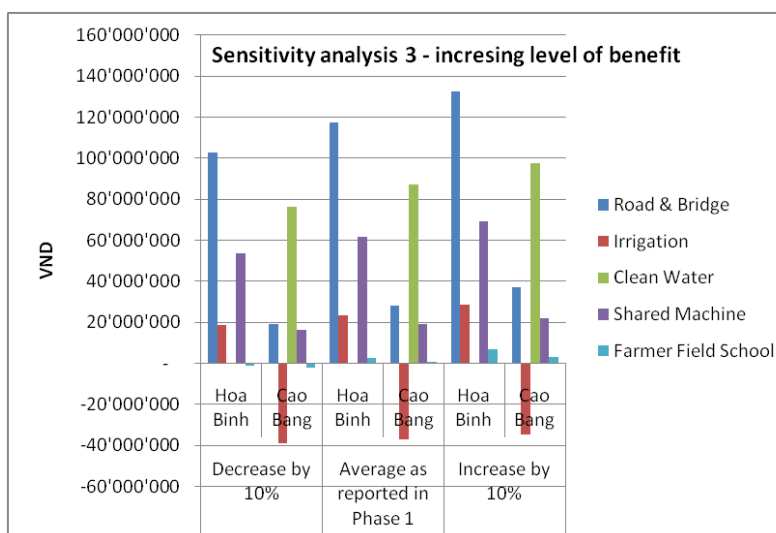
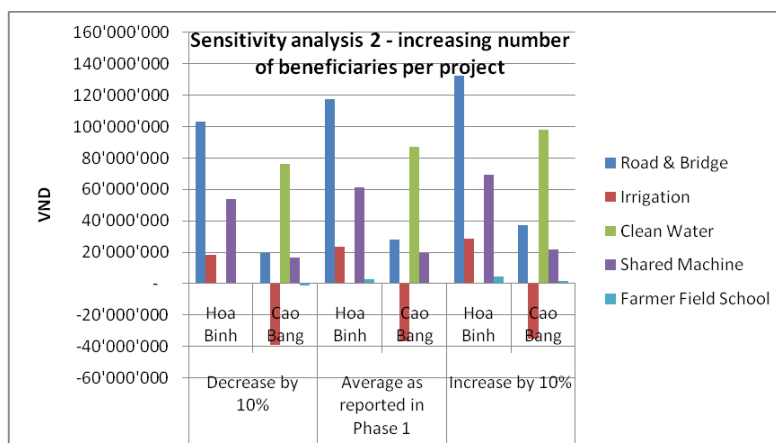
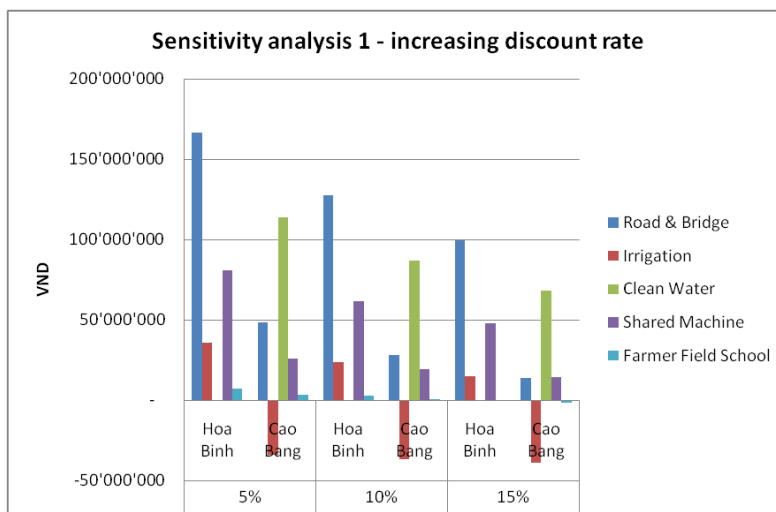
For the present report, we have focused on 3 parameters for the sensitivity analysis, namely the discount rate, the number of beneficiaries per project and the level of benefit.

Of course it would make sense to go a step further and combine different effects, such as the simultaneous change of number of beneficiaries and their level of benefit, with “optimistic” and “pessimistic” scenarios. But this would probably make more sense when the project will have more solid information about real impact, not just assumptions as in the present report.

Another important factor for the benefits of the rural population is the market price for agricultural products. This factor is not explicitly included in the model, but indirectly the market situation can be simulated while modifying the line “improved cultivation” and “improved livestock” in the assumptions. The effect of higher or lower market prices will ultimately have the same effect on household income as higher or lower production (expressed in VND / hh).

The model shows a rather stable behaviour within the range of fluctuation that we have tested. The irrigation project in Cao Bang

seem to be the most problematic element, however with not enough evidence (such as average field size of the beneficiaries) to draw conclusions.



6.2 Discussion

While in chapter 3.2 we have mentioned that the model would be a social CBA (SCBA), we did not yet discuss the issue of opportunity costs, with exception of the labour costs (see chapter 5.2).

Economic analysis

State interventions in Vietnam are numerous, especially in the agricultural sector. Inputs are mainly supplied by state owned companies, with price regulation, quotas and trade control. Output control also exists, with ceiling price for rice and export regulation. The government also provides subsidies to export companies who buy, store and trade rice.

If the model is to be refined and adapted to the situation in PSARD 2, then it may be worthwhile looking into these issues to get a complete picture of State interventions and their effects on rural livelihoods.

Coverage of the CBA

There are still some costs that are not included in the model: they are mentioned under “others” for Hoa Binh and Cao Bang, and also “clean water and toilets in Hoa Binh” for which there was not enough information. Therefore the general PSARD CBA model covers 99% of all the costs.

Implementing the CBA during PSARD phase 2

In phase 2, there will be more options for communes to select projects compared to phase 1. There will be no more quotas for infrastructure projects, and additional categories of projects may be included (health, education ...). Applying the CBA model to PSARD phase 2 can be done as follows: the CBA models developed in this report – based on the assumptions and information from phase 1 – are used to build the model for phase 2. Assuming how many projects of each category will be implemented in phase 2, the new phase can be modelled easily. However, the same weaknesses as in the present model will be there until more reliable information (from specific impact studies) will replace the present impact assumptions. Looking at the higher profitability of the project in Hoa Binh, the model for phase 2 is likely to confirm the picture of phase 1: investments in Hoa Binh will remain more profitable than investments in Cao Bang due to the more favourable context for development.

Additional benefits and questions of distribution

There are additional benefits, in particular for the poor, that were not considered in the calculations, namely the income that they could earn while working on the construction of the infrastructures (i.e. not contributions in kind but paid labour, this was done mainly by poorer households). The CBA does also not really take into account the question of equity and distribution of the income. Clearly there is a bias towards the better off as far as the benefits of infrastructures are concerned: a small irrigation system will benefit more the farmer who has more land... this aspect should also be analysed within the framework of the suggested case studies.

Why CBA over ten years?

For several of the small rural infrastructure project, it is questionable whether the construction will last 10 years without major repair. Therefore it may be considered too optimistic to make CBAs over a period of ten years. On the other hand, if major repairs are needed, these can be simulated and introduced in the model when these costs occur, up to a complete reconstruction (initial investment costs repeated after 5 years if the construction lasts only 5 years).

7 Recommendations

The recommendations of the mission are summarized as follows:

- CBA approach is relevant in the context of PSARD; however it has limitations and should only be applied where there are clearly quantifiable benefits: these are primarily all infrastructure projects, but also capacity building (such as FFS) and services for farmers.
- Case studies for impact assessment and quantification for different kinds of projects should be done; this could be a task for students doing their field research⁶, under the guidance of PSARD team. The methodology for these case studies should be carefully elaborated as improper methodology will not lead to the expected results (ref. quantitative impact analysis).
- It is not realistic to collect data on a large scale to verify the CBA model, as this would lead to very high costs for M&E.
- PSARD should consider assessing all the data available at local level that could be relevant for the CBA model. During our field trip, we could see such data at commune level which is not available at central level. However this should not induce unreasonable costs (e.g. if the data is not available electronically).
- A risk of the CBA model is that projects with short term benefits will be favoured compared to projects with longer term benefits. Use CBA as ONE tool for the selection of projects. Do not prioritize short term benefits just because of the CBA.
- Non quantifiable benefits (including social benefits) and externalities of projects should be adequately considered.
- As the CBA approach used for this model is a SCBA, the mission recommends to look into State interventions in the agricultural sector (and in the rural sector) to find out what is the real situation of shadow prices, distortions and their influence on rural livelihoods (policy analysis, macro and micro levels, etc.)
- The mission also recommends sharing information about impact analyses with other interested donors in order to fine tune the methodologies and to develop a system that includes different methods, the CBA being just one method among others for impact analysis.
- If SDC considers it worthwhile to use PSARD phase 2 as a pilot for CBA implementation (and the mission recommends to do so), then additional resources will be necessary as the requirements in terms of data collection and processing for CBA goes far beyond the normal M&E.

⁶ One student from the Swiss College of Agriculture may come next year in this context, but this task would require more than just one student

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Annexes

Annexe 1 Terms of reference: CBA mission for PSARD

Context

SDC is concerned about the effectiveness of its interventions. All SDC projects are held accountable for the economic and effective use of resources. A multitude of different methodologies and criteria are available for project evaluation. The economic and financial analysis is an approach that examines whether the project is economically viable, sustainable. Concepts like net-present-value, cost-benefit-relations, internal rate of returns are commonly used. It is in particular required to analyze in greater detail cost benefit relations in end of phase reports as well as to increasingly elaborate on this issue when proposing new projects. Evaluations ex-post, mid-term as well as ex-ante should therefore delve into these topics. However, due to the nature of SDC projects (creation of public goods, long term effects, outreach to huge target groups, imperfect secondary data, etc.) the consultant has to strike the balance between reasonable effort and scientific robustness of her findings. Therefore, it is recommended to build in sufficient reserves for errors, risks and omitted aspects.

Introduction

The Terms of Reference present the purpose, scope and requirements of a cost-benefit analysis for interventions supported by the Swiss Agency for Development and Cooperation (SDC) in Vietnam through the PSARD project.

SDC has supported the provincial governments of Cao Bang (CB) and Hoa Binh (HB), and MARD to implement PSARD for the first phase (2008-2010). The program aims to improve public service delivery in the Agricultural and Rural Development (ARD) sector with the overarching goal to improve the livelihoods of people in rural Vietnam. More specifically, the program purpose is *“to contribute to building up efficient and effective decentralized public service delivery systems and processes in agriculture and rural development”* through a pro-poor demand-led service provision particularly for farmers, ethnic minorities and women living in the upland areas and thus contributing to poverty reduction. After 3 years of implementation, the program has achieved some concrete results⁷, which are considered convincing enough for SDC to continue to support for the second phase of four years to ensure sustainability⁸. The project’s overall goal is *“to contribute to province and district-wide mainstreaming of participatory local planning, financial decentralisation and improved public service delivery in agriculture, in order to reduce poverty and improve livelihoods in disadvantaged areas of HB and CB provinces”*.

Objective and expected Output

An ex-post cost-benefit analysis to be included in the end of phase II report is the objective. To prepare this, an ex ante cost-benefit analysis of the PSARD phase II will be done, using the costs incurred during Phase 1 (previous) and Phase 2 (current) and expected benefits. This will provide a) indications to the project implementers on items which provide most benefits and most costs, thus enabling an informed discussion and possibly make adjustments towards improving economic impact, and b) recommendations on data collection needs during Phase 2 to provide firmer basis for the ex-post analysis.

1. An economic ex ante analysis of the project Phase 1 + 2.
2. Condensing the most relevant information in
 - a) an excel spreadsheet, allowing the modification of assumptions and doing sensitivity analysis (e.g. separate sheet on assumption and questions of attribution)
 - b) explicit description of how the attribution to the project has been modeled
 - c) a succinct explanation of the underlying assumptions, easy to understand for a non-

⁷ See Final Report 2008-2010

⁸ See Project Document

- expert third party
- d) containing at least calculations of the internal rate of return, net present value and discounted and nominal cost-benefit relations and other management ratios considered as relevant in the specific case
- e) reasonable, plausible explanations concerning estimations (comprehensible for non-expert third parties)
- f) interpretation and critical evaluation of the findings in 1-2 pages
- 3. Capacity Building of SDC staff and partners on how to use the outputs - if necessary
- 4. Recommendations to improve the project M&E systems for improved integration of economic and financial analysis concerns

Activities

We suggest a stepwise approach:

1. All SDC projects have log frames and usually quantified objectives with indicators and measurement systems (M&E). Based on this and in dialogue with the project staff and technical advisor, the consultant shall develop a workable CBA model for the PSARD project that allows quantifying the most relevant benefits of the project, ideally combined with the corresponding cost (total cost, see below 3.).
2. Establishment of result chains to illustrate the attribution.
3. Calculation and attribution of total project costs (SDC plus other costs, in-kind and financial contributions of partners, negative externalities, etc.) and estimated benefits (e.g. increased farmers productivity or income, increased participation of people's participation in commune planning and budgeting, increased efficiency of public fund investments at commune level, etc.)
4. Establishment of the flow of funds over time (highlighting investment, divestment, depreciation, liquidation values etc. – if applicable) and estimation of internal rate of return, net present value, etc.
5. Report writing incl. analysis, explanations, recommendations
6. 2-3h crash course on how to interpret the major ratios and use the model (allowing elaboration of scenarios, revision of calculations, doing sensitivity analyses).

Team and qualifications

The team will comprise of one international consultant and one national consultant. The consultants should be experts on project cost- benefit analysis

Duration and tentative schedule

The team will be working in the period from 08 to 20 Aug. 2011 (10 working days).

Expected products

1. A draft report in English (max 15 pages) presented to partners and SDC on 17 Aug. 2011.
2. A final report in English and Vietnamese (max 20 pages) including an executive summary (max 1 page) and all the specified outputs submitted to partners and SDC by 20 Aug. 2011
3. Annexes should include detailed methodology.

Duty Station: Vietnam.

Accompanying Documents:

1. PSARD Project Document 2011-2015
2. Satisfaction survey report 2010
3. Current M&E system
4. PSARD 2008-2010 report
5. CDF impact assessment
6. Other related documents from the project upon request

Annex 2 Mission programme

Date	Activities	Venues	Participants	Res.
07.08.2011	Arrival Dominique from Switzerland			
08.08.2011	Briefing Meeting	SDC	SDC, helvetas, consultants	
09.08.2011			Dominique	
8.30 – 12.00 13.30 – 17.00	Introduction to project, activity lines and ideas for M&E system	Helvetas Office	Yen, Dominic, Ngoc Anh	Yen, Dominic
10.08.2011				
6.30 – 8.30	Travel to Hoa Binh			
8.30 – 10.00	Meeting with PPMU Hoa Binh	PSARD HB office	PPMU Manager, POs	Dinh/Consultant team
10.00 – 11.30	Meeting with DARD representatives	DARD office	Director and representatives from implementing agencies under DARD	Dinh
13.30 – 17.00	Meeting with DPI and DoF	PS-ARD HB office	Vice-Directors of DPI, DoF, key implementing members	Dinh
11.08.2011				
7.00-8.00	Travel to Tan Lac district			
8.00-11.00	Discuss with district representative	DPC office of Tan Lac	Representatives from DPC, relevant sections who know most about PS-ARD	Dinh & Consultant team
13.00 – 13.30	Travel to commune (Dich Giao)			
13.30-16.00	Discuss with CPC representative, interview households	CPC Office	CPC members, households.	Dinh & consultant team
16.00	Back to Hanoi			
12.08. – 16.08.2011	work on mission report	Helvetas office and hotel	consultant team	Dominique
17.08.2011	Workshop	SDC	consultant team	Dominique
18.08.- 19.08.2011	Finalizing report	Helvetas	consultant team	Dominique
20.08.2011	Travel to Luang Prabang			Dominique

Annex 3 Sensitivity analysis tables

		Discount rate varies					
		5%		10%		15%	
		Hoa Binh	Cao Bang	Hoa Binh	Cao Bang	Hoa Binh	Cao Bang
NPV	Road & Bridge	166'546'072	48'313'881	127'487'078	28'211'798	99'664'308	13'980'327
	Irrigation	35'586'805	- 34'152'212	23'576'668	-36'960'007	15'058'195	- 38'851'817
	Clean Water		113'791'443		87'030'899		67'969'382
	Shared Machine	80'833'671	26'037'426	61'469'866	19'195'977	47'680'575	14'329'986
	Farmer Field School	7'072'921	3'123'892	2'591'200	323'072	- 466'616	- 1'575'573
	PSARD NPV	68'167'614'480		34'914'906'145		11'819'222'560	
IRR	Road & Bridge	104%	22%	104%	22%	104%	22%
	Irrigation	31%	-13%	31%	-13%	31%	-13%
	Clean Water		102%		102%		102%
	Shared Machine	91%	59%	91%	59%	91%	59%
	Farmer Field School	14%	11%	14%	11%	14%	11%
	PSARD IRR	17%		17%		17%	

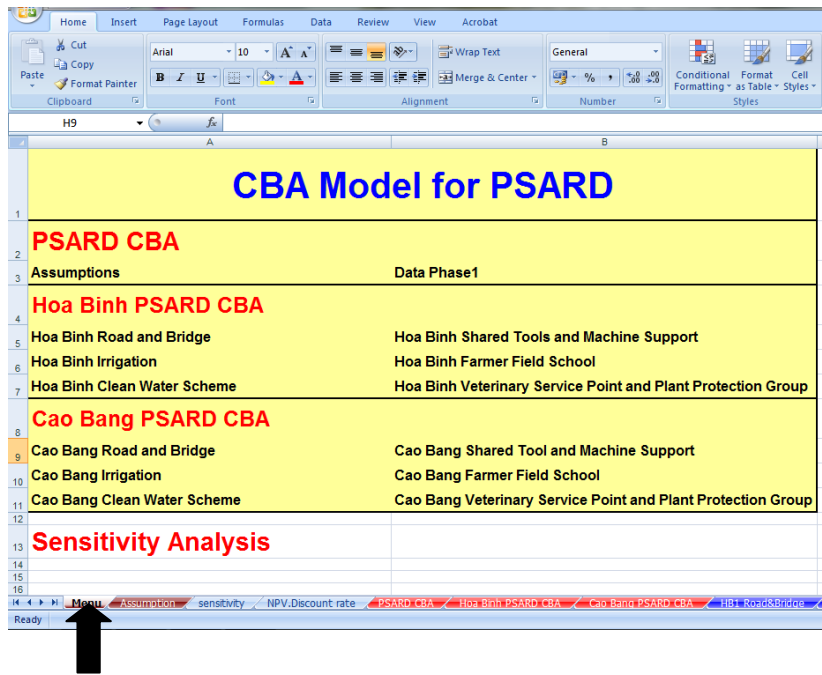
		Number of beneficiaries varies, discount rate fixes at 10%					
		Decrease by 10%		Average as reported in Phase 1		Increase by 10%	
		Hoa Binh	Cao Bang	Hoa Binh	Cao Bang	Hoa Binh	Cao Bang
NPV	Road & Bridge	102'874'069	19'339'043	117'617'170	28'211'798	132'360'271	37'084'553
	Irrigation	18'415'231	- 39'049'160	23'576'668	-36'960'007	28'738'104	- 34'870'855
	Clean Water		76'247'183		87'030'899		97'814'614
	Shared Machine	53'635'543	16'375'621	61'469'866	19'195'977	69'304'189	22'016'334
	Farmer Field School	526'625	- 994'938	2'591'200	323'072	4'655'775	1'641'081
	PSARD NPV	16'063'356'169		30'749'804'881		45'436'253'593	
IRR	Road & Bridge	93%	19%	104%	22%	115%	26%
	Irrigation	27%	-15%	31%	-13%	35%	-11%
	Clean Water		91%		102%		113%
	Shared Machine	81%	52%	91%	59%	100%	66%
	Farmer Field School	11%	8%	14%	11%	17%	14%
	PSARD IRR	13%		17%		20%	

		Benefit level varies, discount rate fixed at 10%, beneficiary number as reported					
		Decrease by 10%		Average as reported in Phase 1		Increase by 10%	
		Hoa Binh	Cao Bang	Hoa Binh	Cao Bang	Hoa Binh	Cao Bang
NPV	Road & Bridge	102'874'069	19'339'043	117'617'170	28'211'798	132'360'271	37'084'553
	Irrigation	18'415'231	- 39'049'160	23'576'668	-36'960'007	28'738'104	- 34'870'855
	Clean Water		76'247'183		87'030'899		97'814'614
	Shared Machine	53'635'543	16'375'621	61'469'866	19'195'977	69'304'189	22'016'334
	Farmer Field School	- 1'331'492	- 2'181'147	2'591'200	323'072	6'926'807	3'090'892
	PSARD NPV	14'719'091'404		30'749'804'881		47'079'243'861	
IRR	Road & Bridge	93%	19%	104%	22%	115%	26%
	Irrigation	27%	-15%	31%	-13%	35%	-11%
	Clean Water		91%		102%		113%
	Shared Machine	81%	52%	91%	59%	100%	66%
	Farmer Field School	8%	5%	14%	11%	21%	17%
	PSARD IRR	13%		17%		21%	

Annex 4 Structure of the excel model

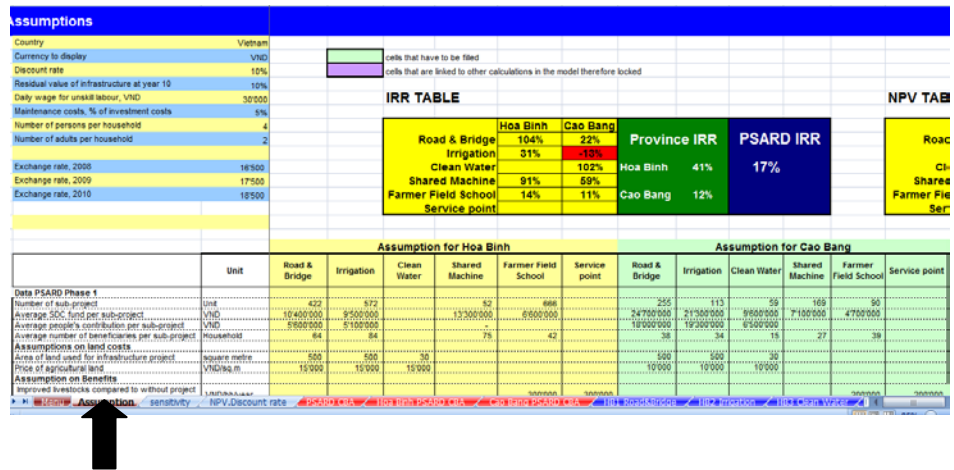
Menu page

Each item on the menu page is clickable and leads to the desired CBA. The specific CBAs for each category of projects (in black), the aggregated CBAs at province and PSARD level (in red).



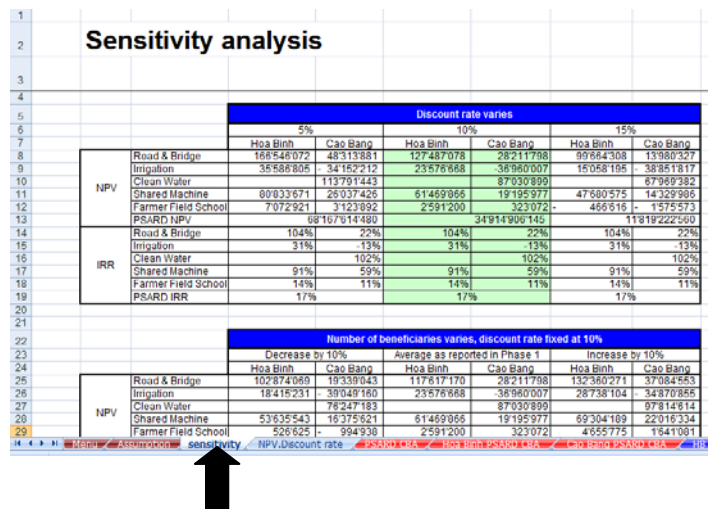
Assumptions

On this page all the project assumptions can be modified (bottom table). The results are displayed immediately in the IRR table above



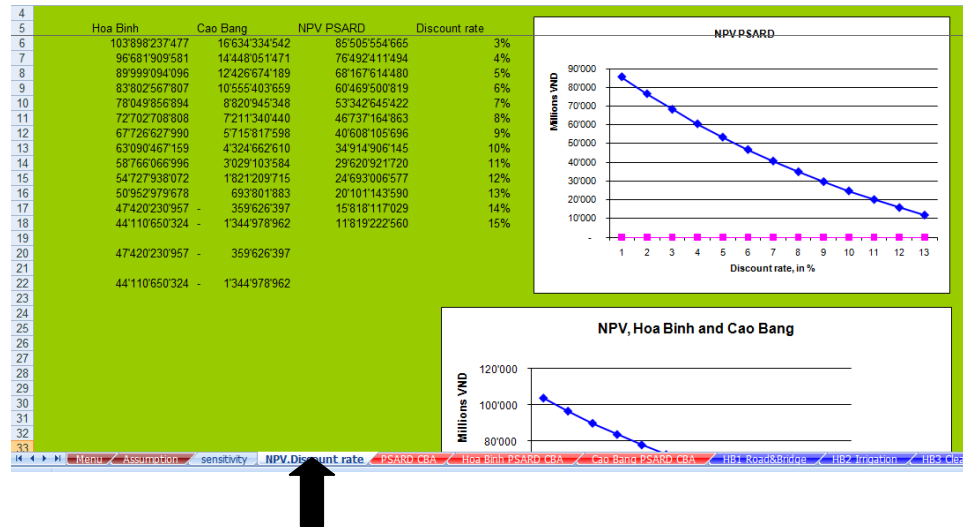
Sensitivity

The sensitivity analysis presented in the report is also in the excel table. This is however a fixed table, as the results from the different scenarios were calculated and inserted as values in the tables. The reader interested to test more options should do it by modifying the assumptions as explained above.



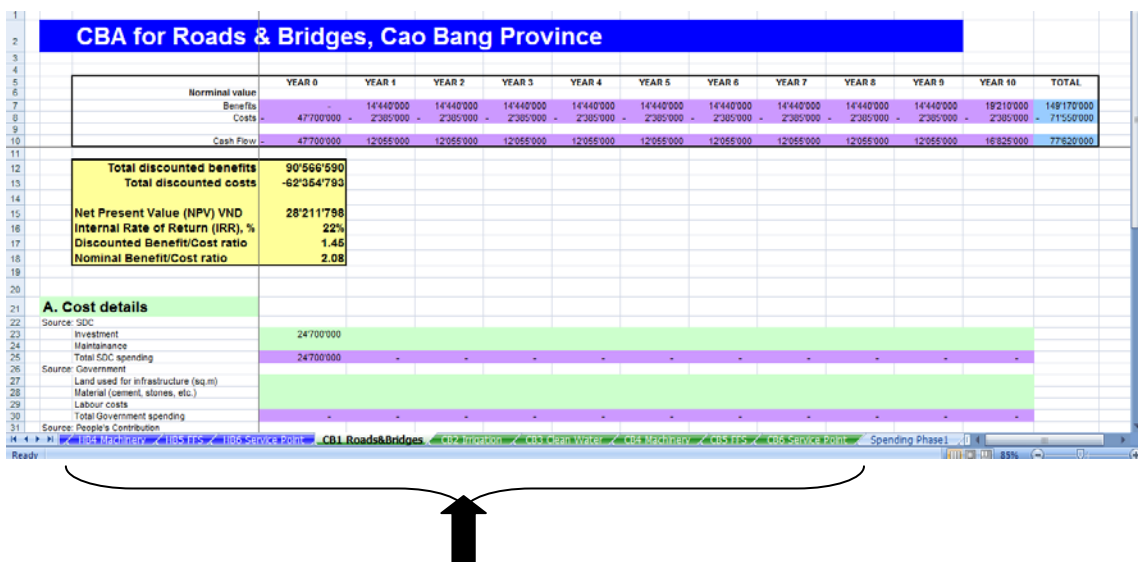
NPV discount rate

The next sheet presents more calculations on the model sensitivity to discount rate change, including the graphs that are also included in the text.



CBA

The CBAs are to be found in all the additional sheets in the excel model. There is a colour code: these sheets can be accessed either from the menu (as explained above) or by selecting the desired sheet from the bottom line. The colour code is the following:



In red the aggregated CBAs		PSARD CBA, Hoa Binh CBA and Cao Bang CBA
In blue Hoa Binh CBAs		HB1 to HB6
In green Cao Bang CBAs		CB1 to CB6

The CBA sheets are all structured in a similar way: the summary information (total costs and total benefits over 10 years) as well as the cash flow appear on top. Then there is a yellow box with the results, and below are the details of the costs and benefits.