

THE BUILDING AND CONSTRUCTION IMPROVEMENT  
PROGRAMME

A Project of The

AGA KHAN HOUSING BOARD, PAKISTAN (AKHB,P)

END OF PROJECT EVALUATION

OF PROJECT CYCLE 2002 – 2003

Sponsored By

UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)  
GLOBAL ENVIRONMENT FACILITY (GEF)  
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FINAL REPORT

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## List of Abbreviations

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AKF	Aga Khan Foundation
AKDN	Aga Khan Development Network
AKPBS,P	Aga Khan Planning and Building Services, Pakistan
AKHB,P	Aga Khan Housing Board, Pakistan
AKHS,P	Aga Khan Health Services, Pakistan
BACIP	Building and Construction Improvement Programme
CIDA	Canadian International Development Agency
EC	European Commission
FES	Fuel-efficient Stove
GEF	Global Environment Facility
HDGI	Hot Dipped Galvanised Iron
MFB	Micro Finance Bank
NRCP	Natural Resource Conservation Project
R&D	Research and Development
RHW	Roof Hatch Window
SGP	Small Grants Programme
USAID	United States Agency for International Development
WWF	Water Warming Facility
WWF-P	World Wide Fund for Nature
WASEP	Water and Sanitation Extension Programme

## Executive Summary

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The Building and Construction Improvement Programme (BACIP) is a progressive and forward looking project of the Aga Khan Planning and Building Services, Pakistan (AKPBS,P). It was initiated under the Aga Khan Foundation (AKF)-PAKSID initiative and subsequently supported by other donors. The project was initiated in 1997 and works in the Northern Areas and Chitral to analyse people's problems related to housing and developing realistic and cost effective solutions. The project is evolving from an applied research project to extension and service delivery. BACIP activities and interventions include research and development of products that improve the domestic environment and structural stability of houses; field testing of products for acceptability and functionality; documentation of products and their manufacturing techniques, product promotion through awareness raising and information dissemination and entrepreneur training and training of contractors to carry out product installation. It has developed and tested 40 home improvement products. Most of the products relate directly to fuel and thermal efficiency (products that conserve fuel wood and forest conservation) whereas 15 of these have been designed to help alleviate conditions of women.

UNDP- Global Environment Facility (GEF), Small Grants Programme (SGP), in line with its mandate for environmental conservation, has funded BACIP for a one year project to work in the communities of Gilgit and Nathiagali. The project duration was from April 2002 to March 2003. The agreement focused specifically on extending to entrepreneurs and artisans for the replication of BACIP fuel-efficient products and techniques and capacity building of local CBOs. Broadly, the objectives include promotion and dissemination of fuel-efficient technologies for environmental conservation and capacity building through training for entrepreneurs, artisans and professionals to replicate BACIP technologies locally.

The project was conceptualised on the basis of a need assessment that identified a number of problems related to housing design and construction. BACIP operates through the village based institutions; it selects two resource persons to manage project activities at that level. A village co-ordinator is also hired to assist project implementation. BACIP selects village households in consultation with the community and installs a model product free of cost so that people can see how it operates and the benefits it produces. Under the project agreement with UNDP, it is promoting three energy efficient products, namely, fuel-efficient stove, water warming facility and the roof hatch window. The models are then monitored by BACIP changes are made subsequently according to their needs, preferences, cultural sensitivities and functionality. Any future demands for new products are placed with the resource persons and through them to the village co-ordinators and serviced out of the Gilgit office by getting entrepreneurs to manufacture the products. Follow up for neighbourhood promotion, repair and maintenance, advice and awareness raising is routinely made afterwards. Radio programmes, bus schemes, community briefings and informative and promotional literature is used as means of awareness raising. Selected entrepreneurs, craftsperson and artisans are trained in product manufacturing and are facilitated in setting up their businesses for service delivery at the household level. BACIP has also developed working partnerships for propagating its fuel-efficient technologies, e.g. the World Wide Fund Pakistan (WWF-P) and the Natural Resource Conservation Project (NRCP).

All BACIP models have detailed manufacturing modules for their manufacturing and training is imparted on the basis of these modules. The training types include (i) host training; (ii) on-job training; (iii) mobile training, and; (iv) three-dimensional (3-D) training. The project has just

completed its first year and it has managed to achieve its objectives and activities to a great extent. Although all products have not been adopted, most of them have picked up, e.g. the fuel-efficient stoves, water warming facility and the roof hatch window (only in Gilgit). Entrepreneurs have been trained in stove making and are running their own shops. The project achievements have been more significant in Gilgit as compared to Nathiagali because of past experience and strong technical and administrative backup and other resources. The project has been aware and sensitive towards involving women in its activities and has exhibited gender sensitivity in all stages of implementation but ensuring equitable women development, integration and participation are all long-term objectives. Considerable improvements have been noted in their material comfort and productive and reproductive roles.

As far as the achievement of project activities is considered, it can be said that the project has been very efficient and effective in meeting its target. In terms of impact, all studies that have so far been conducted report significant improvements in this regard. Consumption of fuel wood and timber has reduced considerably and the rate of deforestation has slowed down. Impact studies indicate an average saving of 60 percent of fuel wood per household annually – 2.8 tonnes of fuel wood per year. In Gilgit, the FES and WWF has been widely replicated and vast reductions in fuel wood collection and usage are reported. The “Nathiagali” FES model is now gaining acceptance in Nathiagali. This changed version is efficient and there is a reported 50 percent consumption of fuel wood. Wall and roof insulation have had limited adoption and impact and are also considered expensive. Among other fuel-efficient products, the roof hatch window in Gilgit can be cited as one of the most efficient technology that has lowered firewood and heating expenses. Lesser smoke, improved ventilation and lighting, lesser blackening of walls and reduction in dust, smoke and soot are some of the positive impacts on the community. It is noted that a combination of two to three housing improvements is expected to have a greater impact on the household energy and health conditions.

Expenditure reduction has been addressed in the form of reduction in the purchase of fuel wood for cooking and heating purposes, reduced expenditure on health due to a 50 percent reduction in illnesses and reduced recurrent costs of repair and maintenance of houses with BACIP products (especially the structural products). Income generation has increased by training and small enterprise development, increased working capacity and productivity. BACIP follows gender neutral and gender specific policies and practices. BACIP products, interventions for community mobilisation and awareness raising reflect gender sensitivity. Women development has occurred through increased improvement in women’s awareness level and understanding of vital issues, their role as resource persons, commission agents and increased comfort level and convenience in performing household chores through use of the gender specific products. Reduced work load, better time and space management, improved living conditions and thus better health and hygiene conditions have also been reported.

Some constraints that BACIP has experienced at the institutional level include programme policy of following a non-subsidised approach, the innovation, number, diversity and complexity in manufacturing and promoting 40 products, a product orientation as compared with a more customer driven approach, after sales service and quality assurance, organisational capacity and resource constraints and lack of service delivery mechanisms. The high level of skills and technical supervision required for replication of BACIP products also poses certain limitations on speedy adoption at the community level. Other problems include procurement of materials, centralised operations and payment procedures as well as the absence of micro-financing schemes for such purchases. Community level constraints include psychological barriers (old

traditions and values), technical barriers, low literacy levels, O&M problems, limited financial capacity, adverse weather conditions, poor roads and infrastructure.

In terms of sustainability, products are said to be economically viable and studies indicate that there is a lot of potential for wide scale replication of the products. Of the existing products the FES, WWF, RHW and gender specific home improvement products can be categorised as highly sustainable and replicable products in terms of economic viability and social acceptability. The dry pit latrines and roof/wall insulation techniques in the villages visited are towards the lower end in terms of being self-sustaining. Planning and improvement has remained integral to the project at the strategic level and at the operational level. A marketing plan has been developed that focuses on development of entrepreneurs and the creation of a trading network for ensuring a sustainable system of production and sale. The main focus for this lies on decentralising operations at the village level; developing local manufacturing and entrepreneurial skills and increased level of production at the grassroots level and outreach to remote area. Linking up with the First Micro Finance Bank (FMFB) for initiating a micro finance scheme is on their agenda for the provision of home improvement loans. The programme methodology has remained flexible to rapidly changing scenarios. A more product-focused approach is slowly giving way to customer orientation. Changing social and economic and environmental conditions are indications that there is immense potential for BACIP's product adoption. The issue of quality control is crucial for the purposes of future replication and sustainability but more important is the need to cut down on the range of products being offered.

The replication of BACIP products has occurred at two levels, both without any direct subsidy from BACIP, namely: (i) at the institutional (project partner organisations) level, and; (ii) at the entrepreneurial level. All future product adoption is expected to be impact-based replications with the impact showing in the second or third year of the project. Some recommendations for the future include strong demonstration effects, intensive and regular follow ups and constant motivation and awareness raising activities so that people's behavioural and attitudinal patterns can be changed. Networking and forming strong institutional partnerships with AKDN institutions; following a more focused and concentrated approach in terms of its product line is also recommended. Similarly, adoption survey and future demand estimation; a micro finance scheme or a revolving fund; creation of a network of more skilled entrepreneurs and trading outfits; overall supervisory and monitoring role to ensure compliance with design and quality standards; gender sensitisation of the entrepreneurs and regional traders and greater awareness raising efforts are part of the recommendations.

# 1. Introduction

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## 1.1 History and Current Focus

The Building and Construction Improvement Programme (BACIP) is a research and extension programme of the Aga Khan Housing Board, Pakistan (AKHB,P), an institution that has been operating in the Northern Areas and other parts of Pakistan since 1981. AKHB,P has operated a number of innovative programmes across the country and in the Northern Areas including the Living Conditions Improvement Programme (1985-1991), the Skills Enhancement Programme (1988 to date) and the Water and Sanitation Extension Programme (1997 to date). The mission of AKHB,P is to “enhance the quality of life of the target population by addressing their housing and infrastructure needs, considering their aspirations and changing technology”. The overall mandate of AKHB,P is to improve the quality of life of the people with respect to their built environment.

BACIP was initiated in 1997 by the Aga Khan Foundation (AKF) through the Pakistan Canada Social Institutions Development Programme (PAKSID), a collaborative initiative of the Aga Khan Development Network (AKDN) and the Canadian International Development Agency (CIDA). The programme has subsequently received funding from other donors including the United States Agency for International Development (USAID) and the United Nations Development Programme (UNDP). The programme operates mainly in the Northern Areas—the five districts of Gilgit, Ghizer, Skardu, Ghanche and Diamer—and Chitral (in the North West Frontier Province, NWFP). It also has operations in Nathiagali (Abbottabad District, NWFP) and three districts of the Sindh Province (also funded by UNDP as a separate component).

The main thrust of BACIP is towards improving the living (housing) conditions of the people and the development of products and interventions that can lead to improvements in fuel conservation, domestic health, domestic economy, and improved quality of life, particularly for women. Its mission is “to promote measures that will enable the communities in the northern region to make sustainable improvements in their living conditions by providing solutions to their housing related problems, allowing them to optimise their investment in built environment related aspects and hence improve the quality of the living environment, especially for women and children.” In broad terms, BACIP’s strategic objectives are two-fold, namely, capacity building of the communities to manage the process of growth and changing conditions in their built environment and development in a sustainable manner through a number of interventions, and the development of institutional capacities to promote and facilitate this process.

From its inception BACIP has retained its main priority of “analysing people’s problems related to housing and developing realistic and cost effective solutions by employing indigenous resources and knowledge, developing local house building techniques and skill enhancement of local entrepreneurs for bringing about changes in lifestyle patterns.” The programme is rapidly evolving from an applied research programme to extension and service delivery. Its evolution can be divided broadly into a number of distinct phases, namely, research, product development, product replication and dissemination and marketing. Phase I of the programme ended on 31 December 2000 and an extension grant (April 2001 – September 2002) was secured through the AKF USA Pakistan NGO Initiative Phase II (PNI II).

BACIP activities and interventions include research and development of products that improve the domestic environment and structural stability of houses; field testing of products for acceptability and functionality; documentation of products and their manufacturing techniques, product promotion through awareness raising and information dissemination, and entrepreneur training and training of contractors to carry out product installation. It has, over time, developed a number of household interventions that represent micro level research work in developing and distributing improved building practices and materials within the household. BACIP has researched and developed 40 products that were field tested and modified to meet local and cultural requirements. Most of the products relate directly to fuel and thermal efficiency (products that conserve fuel wood and forest conservation) and 15 of the 40 products have been designed to help alleviate the living conditions of women and children and positively impact their domestic environment.

## 1.2 BACIP Collaboration with UNDP

The UNDP Global Environment Facility (GEF) works around the world to support countries in the development of effective policies and institutions, such as integrating environmental and development objectives into national development agendas and processes, to protect the environment as well as to reduce poverty. This partnership supports the development of projects in the environmental focal areas of biodiversity, climate change, international waters and ozone depletion. The Small Grants Programme (SGP) operates under UNDP/GEF to provide technical and financial assistance to projects in developing countries that conserve and restore the natural world while enhancing well being and livelihoods in a sustainable manner. Under its mandate, the GEF/SGP gives small grants and donations to a non-governmental organisations (NGOs) and community-based organisations (CBOs) for bringing technical (design, implementation) innovations for community development and creating a useful dialogue between government, community and donors for identifying and developing solutions to make sustainable improvements in environment and living conditions.

BACIP entered into a partnership with UNDP GEF/SGP to implement a project within the new rural communities of Gilgit and Nathiagali. The project duration was from April 2002 to March 2003. The agreement focused specifically on extending training to entrepreneurs and artisans for the replication of BACIP fuel-efficient products and techniques, and capacity building of local CBOs. The products emphasised for demonstration and promotion under the agreement include the fuel-efficient stove, water warming facility and roof hatch window. The total project cost is Rs 3.92 million, of which the SGP contribution is Rs 2.97 million while BACIP contributed Rs 0.95 million through staff time, vehicle use and overheads.

The UNDP GEF/SGP project was supposed to work on promoting fuel-efficient housing technologies in four villages each in Nathiagali and Gilgit region but has actually extended its work to several additional villages. The selection of the villages was made with the consideration that BACIP should have done little or no work in these villages in the past. Broadly, the objectives included the promotion and dissemination of fuel-efficient technologies for environmental conservation and capacity building through training for entrepreneurs, artisans and professionals to replicate BACIP technologies locally.

The project proposal gives the following specific objectives:

- ú Training of local entrepreneurs in four market villages of the Gilgit region and four market villages of the Nathiagali region to manufacture BACIP products, particularly those that promote fuel wood and forest conservation objectives and improve living conditions for women and children. The products emphasised are fuel-efficient stoves, water warming facility, and roof hatch windows/double glass windows; some other products are included in the project at an introductory level.
- ú To promote the various BACIP products amongst the community in order to generate demand for the entrepreneurs and to accelerate the adoption process.
- ú To promote women development and greater gender equity by involving them in various aspects of the programmes and promoting an improvement in their living conditions.
- ú To disseminate BACIP research and impart training to selected NGOs, government agencies and professionals.

The key activities carried out under the project are entrepreneur/artisan training, promotional activities for raising the demand of BACIP products, the dissemination of BACIP products, other processes for enhancing institutional collaboration and impacts, and monitoring and evaluation.

### 1.3 Scope, Approach and Limitations of the Evaluation

This evaluation exercise is aimed, in particular, at the BACIP, UNDP GEF Small Grants Programme (project phase April 2002 – March 2003) with the intention of assessing overall accomplishments and obstacles and identifying recommendations for developing future strategies. Specific issues that are addressed in the report include an assessment of whether the project objectives and activities have been achieved and the impact of BACIP products on fuel efficiency, environment conservation, expenditure reduction, income generation and on women, at the local level as well as in a broader context. Some issues related to the potential for replication are also discussed. The complete scope of work is elaborated in the Terms of Reference (ToR) for the evaluation, reproduced as Annex I.

The approach adopted for the evaluation included the following elements:

- ú A two-person team consisting of Tariq Husain as the team leader and an EDC Consultant, Mahe Nau Haider, conducted the evaluation.
- ú The team conducted a detailed desk review of all project related information and other literature provided by BACIP to the consultants. The references (listed in the References section) included the project documents, strategy papers, progress and monitoring reports and a large number of studies, reviews and assessments carried out previously by BACIP and its consultants.
- ú The exercise included review and analysis of quantitative and qualitative data provided by the project on the adoption of various products and their impacts on the beneficiaries and the environment.
- ú It also included a project briefing given by the Project Manager and discussions with project management, field staff and partner organisations (refer to Annex II for a list of people with whom the evaluation team met for various purposes).
- ú The team, accompanied by BACIP staff, carried out field visits (identified in Annex II) to Gilgit Town and village Singal in the Gilgit Region, and villages Tauheedabad and Kundla in the Nathiagali Region. During these visits, the evaluation team met with some of the beneficiaries of BACIP, some non-adopters, entrepreneurs trained by BACIP, and

- women who had been involved in the project as clients and as recipients of awareness raising and promotional activities undertaken by the project. A meeting with a Nathiagali based entrepreneur (stove maker) was later held in Islamabad.
- ú The evaluation team presented the draft evaluation report to a variety of stakeholders at a workshop organised by UNDP, where participants from different backgrounds gave their comments on the BACIP approach and the draft evaluation.

The evaluation report needs to be viewed in the context of certain constraints and limitations that arise mainly from the scope, duration and methodology adopted for the evaluation. In this context, it needs to be noted, first, that this was a short-duration exercise that aimed to cover two very different and distant project areas at a time when there was snow on the ground in one area and the weather conditions were unfavourable in both areas. The time and weather conditions prevented the team from conducting a more extensive on-the-ground investigation that might have provided greater depth to some of the findings and recommendations.

Secondly, the evaluation relies heavily on secondary data analysis contained mainly in earlier reports commissioned by BACIP. Although most of these reports appear to be of high quality, the evaluation team did not have the means to verify their findings and recommendations systematically with its own data and analysis. The evaluation team's own observations from the target group are neither comprehensive nor statistically reliable. The team did, however, request BACIP for analysis of primary data available with the project, and BACIP obliged without hesitation. Similarly, BACIP was most forthcoming in trying to quantify the cumulative impact of the fuel and thermal efficient products at a national and global level, as the evaluation team was unable to perform this exercise itself.

Lastly, it should be pointed out that the project duration covered under the present exercise is only one year. This is not a long enough period for the actual impact of project interventions to become visible in a measurable way, especially, on a wider scale. Nor, for that matter, can trends in the adoption of innovative products be extrapolated from such a limited experience—one year in a handful of villages. The evaluation team used a number of instruments to overcome these limitations to some extent. In particular, the evaluation forms an idea of actual impact by looking at studies of potential impact, commissioned earlier by BACIP, and estimating the extent to which the population appears willing to adopt specific products.

It should be emphasised, however, that this evaluation is based on internationally accepted principles for the evaluation of development assistance<sup>1</sup>. According to these principles, evaluation has two main purposes, namely, promoting accountability, which means assessing the results and impact of development assistance, and providing lessons for improving the performance of future projects and programmes. The idea of independence is also among the main principles of evaluation, and it means that the evaluation process should be impartial and independent from both the policy-making process and the delivery and management of development assistance. Independence is best achieved where evaluation activities are independent from managers who have an interest in showing good performance, or any other decision-makers for whom evaluation raises a conflict of interest. Independence also requires that the evaluators should exercise independence of mind and that their judgments should not be influenced by the other stakeholders.

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<sup>1</sup> As set down in: Organisation for Economic Co-operation and Development/Development Assistance Committee, Principles for Evaluation and Development Assistance, OECD, Paris, 1998.

## 2. BACIP Technologies and Practices

### 2.1 Need Assessment and Approach to R&D

BACIP was conceptualised on the basis of a participatory rapid appraisal undertaken in the rural communities of the Northern Areas and Chitral. This need assessment exercise identified a number of problems related to housing design and construction, inadequate space management, structural and thermal constraints and lack of proper ventilation (air and light). Issues related to health and unhygienic practices, lack of a sewerage and sanitation system, excessive smoke emission, dust and dampness inside the house and vulnerability of houses to earthquakes and natural calamities also came to the fore. These were some of the issues and considerations that the programme set out to address by developing products and interventions that were designed to mitigate negative impacts on the people and their surrounding environment.

After completing the need assessment exercise, the programme went through a number of stages from product development to mass replication. The first distinct phase of the programme lasted from 1997 to December 2000 and focused mainly on research and development (R&D) activities; this phase was funded by CIDA for researching and designing improvements at the household level. In 2001, BACIP moved on to developing a base for promoting and replicating these products and interventions within the communities, and demonstrating their functionality, acceptance and benefits. An attempt was made to consolidate the programme and obtain validation through external resources before initiating mass replication and training in 2002.

The R&D process identified a total of 82 products, of which 60 products were subsequently field tested and adopted by the communities with varying degrees of acceptance and success. Some 40 products were selected for dissemination; of these, 11 products pertain to fuel efficiency objectives and around 15 address or impact women's status and needs. BACIP selected three products—the most popular ones—for dissemination through the UNDP GEF/SGP grant and included some others at an introductory level. At the request of the evaluation team, BACIP prepared a summary table (Table 1) that indicates the kind of effort and user feedback that went into the development of these products.

Table 1:  
Summary of the R&D Phase for 12 BACIP Products

No.	Product Name	First Prototype (Year)	Last Prototype (Year)	No. of Variations between first and last prototype
1	Roof Hatch Window	1998	2000	4
2	Wall Insulations	1998	2000	7
3	Roof Treatment Techniques	1997	2001	3
4	Fuel-Efficient Stoves	1998	2002	6
5	Household Furniture	1998	2000	4
6	HDGI Wire Wall Reinforcement	1999	2000	3
7	Dry pit composting latrines	1998	2001	6
8	Light Roofs	1999	2001	3
9	Water Warming Facility	1999	2000	3
10	House Planning Tools	1998	1999	2
11	Solar Cooker	2002	2003	4
12	Solar Water Heater	2003		2

As Table 1 shows, most of the products selected for dissemination under the GEF/SGP grant have undergone 3 – 4 changes each in design as a result of user testing during the R&D phase. Feedback given by users led to as many as six changes in the prototype of the fuel-efficient stove, and this does not include changes made subsequently by the entrepreneurs in view of feedback from their customers. All of these changes were introduced as a result of R&D in and feedback from the Northern Areas. BACIP is confident, however, that the thoroughness of the R&D process has given it product designs that can be introduced with little or no modification in any part of the country. One consequence of this confidence is that BACIP did not propose an explicit phase of user testing or product refinement for the GEF/SGP project area in Nathiagali, although this was carried out in practice.

The agreement with GEF/SGP included three main energy efficient products for promotion and some additional products to be introduced on a trial basis. These products have been categorised as follows on the basis of their properties and impacts:

- ú Thermal products: RHW, wall insulation, roof insulation, floor insulation
- ú Structural products: Wall reinforcement, light roof construction, roof water proofing.
- ú Fuel-efficient stoves (FES) plus water warming facility (WWF).
- ú Double vault dry pit latrines.

BACIP describes 10 of these products as high impact<sup>1</sup> products and the remaining ones as value added products.

## 2.2 Approach to Demonstration and Dissemination

The project documents define a total of 18 steps involved in the process of developing and replicating a product. These are: research; prototype development; field testing; models in houses; product diversification; product manufacturing; manufacturing manual; manufacturing tools; supply of essential materials or parts; choice of models; marketing; road shows and bus schemes; more models in the houses; monitoring and evaluation; mini-models; contracting production; delivery of materials and equipment; promotion; replication by entrepreneurs.

The starting point for dissemination is the introduction<sup>2</sup> of the programme at the village level through a number of community consultations or discussions with village elders, existing institutions and women. Wherever possible, this is channelled through existing village institutions, mostly the village organisations and women organisations formed under the Aga Khan Rural Support Programme (AKRSP) or other development organisations. Once the community has been briefed on the project objectives and they have agreed to the terms and conditions of the programme, they are asked to nominate two resource persons<sup>3</sup> (an equal number of males and females with a minimum skill base and past experience). These resource persons are then entrusted with the tasks of managing, promoting, co-ordinating and monitoring the programme at the village level and assisting the BACIP village co-ordinator<sup>4</sup> for taking forward all programme related activities there.

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<sup>1</sup> By “impact” BACIP means the impact that would result if a product were to be adopted. In this evaluation, however, the term “impact” is used mainly for actual impact, which takes into account the number of households that actually adopt, or are likely to adopt, a product.

<sup>2</sup> Based on “BACIP Integrated Approach of Community Mobilisation.”

<sup>3</sup> See BACIP “Selection Criteria for Resource Persons.”

<sup>4</sup> See “BACIP Selection Criteria for Village Co -ordinator.”

According to the BACIP programme implementation strategy, the project installs a one time fully subsidised product at the village household level as a model that helps further product replication on the basis of its benefits and impact. The standard methodology includes identification of a maximum of 10 households<sup>1</sup> where BACIP products (a maximum of 10 per village) can be installed as demonstration units. These households are generally selected on the basis of their social standing within the village and ability to play an effective role in promoting the product. In certain cases the households also contribute labour and/or raw material for the installation of the product. The models are then monitored by BACIP staff according to their reporting format and the feedback generated is used for making any modifications or alterations according to their needs, preferences, cultural sensitivities and functionality. Any future demands for new products are placed with the resource persons and through them to the village co-ordinators and serviced out of the Gilgit office by involving entrepreneurs in product manufacturing. Follow up for neighbourhood promotion, repair and maintenance, advice and awareness raising is routinely made afterwards.

Awareness raising for product replication is carried out by employing a number of dissemination tools and techniques. These include radio talk shows in local languages, road shows, bus schemes, leaflets and brochures, training and cultivating the local resource persons and women as sales agents who are given incentives to help promote and accelerate replication process. Local artisans and craftspeople are usually involved in the process of mobilising and educating the community. Imparting product specific training and ongoing monitoring and evaluation for product improvement and refinement to suit the changing needs of people are also steps taken to accomplish this objective.

Programme (as well as UNDP project) implementation strategy emphasises forging linkages or working partnerships with other organisations and programmes that have similar mandate and objectives. In this way, BACIP includes other partners to co-operate and develop synergies for propagating its fuel-efficient technologies (interventions and techniques) at a wider scale. Current partnerships under the UNDP project include the World Wide Fund for Nature – Pakistan (WWF-P) and the Natural Resource Conservation Project (NRCP) sponsored by the Government of NWFP and the European Commission (EC). WWF-P and NRCP are both working on issues related to resource conservation, reducing deforestation and capacity building.

Under the training component the project is providing skills and training to selected entrepreneurs, artisans and craftspeople so that service delivery at the household level can be enhanced. Most of the BACIP products have detailed manufacturing modules for their manufacturing and training is imparted on the basis of these modules. The training types cater to different skills base and include (i) host training; (ii) on-job training; (iii) mobile training, and; (iv) three-dimensional (3-D) training. Host training trains basic skilled entrepreneurs by placing them with a master trainer who teaches them advanced skills as well as the basics of business management. On-job training imparts training to village handy men and artisans in real time by involving them in an ongoing process of product manufacture and installation whereas mobile training has been designed to facilitate training for those in remote and inaccessible areas by training them in their region. The 3-D training is an in-house exercise that brings together multi-skilled and discipline team for exchange of experiences, ideas and information.

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<sup>1</sup> See "BACIP Selection Criteria for Model Houses and Contract for Home Improvement."

### 3. Evaluative Aspects of the Project

#### 3.1 Achievement of Project Objectives and Activities

The BACIP-UNDP/GEF project has just completed its first year and as far as meeting proposed objectives and activities is concerned, it has fared quite well. As Table 2 shows, the quantitative outputs have been achieved or exceeded in terms of training and product installation.

Table 2: List of BACIP GEF/SGP Activities versus Targets (April 2002 – March 2003)		
Description of Activity	Project Target	Cumulative Achievement
ú Total no. of entrepreneurs/artisans trained that produce one or more BACIP products	60	62
ú No. of entrepreneurs participated in host training	10	13
ú No. of entrepreneurs trained as master trainers	10	10
ú No. of females trained on BACIP product promotion and/or dissemination	15	15
ú No. of senior staff from other institutions attended BACIP awareness workshop	12	23
ú No. of BACIP staff trained at other institutions	3	5
ú No. of other artisans and craftspersons trained	0	75
ú Model house designed/planned with fuel -efficient technologies	0	2
ú No. of villages addressed in target area	8	13
ú Villages outreached (outside target area) through other NGOs	0	3
ú Entrepreneurs who have established own business for BACIP products	0	7
ú No. of national workshops organised	1	1
ú No. of in-house training sessions for entrepreneurs	4	4
ú No. of mobile training at Nathiagali	2	2
ú No. of mobile training at Gilgit	1	6
ú No. of field training sessions at Nathiagali	2	4
ú No. of host training sessions conducted	2	5
ú No. of on-job training at Nathiagali	2	3
ú No. of sub-regional village training workshop (field sessions/briefings)	2	5
ú No. of road shows	4	9
ú No. of workshops for professionals	3	3
ú BACIP staff trained	3	5
ú No. of models installed to promote BACIP products	80	135
ú Institutional collaboration/dialogue for dissemination with other NGOs	0	8
Source: Brief Achievement Report (April 2002 – Mar 2003), BACIP		

A total of 819 BACIP products have been installed and replicated by BACIP, WWF-P and NRCP in the UNDP project area including Nathiagali region (Tauheedabad, Malach, Doonga Gali, Khandkallam, Kerisafi and Nathiagali town) and in Gilgit (Singal, Sonikot, Gilgit town, Phunder, Serbal, Chapursan and Rahimabad). The reported number of products manufactured and sold by entrepreneurs in and outside the UNDP project area is 96 in Nathiagali and 2,510 in Gilgit.

The objective of imparting training to entrepreneurs has been accomplished in the sense that some eleven entrepreneurs have been trained in the Gilgit and Nathiagali regions. It is, however, true that the objective of promoting all the other products identified at the introductory level is yet to be fulfilled for a number of reasons that are explained in the following sections. In terms of acceptability and adoption, the products that have been most successful in Gilgit are the RHW, FES and WWF, and to some extent the double glass window. Overall, the project achievements have been more significant in Gilgit because the project had already done a considerable amount of work in the area, and because of past experience and familiarity with the area, ease in community mobilisation, continuous presence of the project staff, strong technical and administrative backup and other resources. In Nathiagali, on the other hand, the project is in its infancy, it is a new and difficult project area, climatic conditions are extreme, staff and other resources are limited, and the cultural and social setting is different from the Northern Areas, where the products were designed.

The objective of generating greater demands for BACIP products amongst the community and therefore for the entrepreneurs and accelerating the adoption rate cannot be viewed in absolute terms because this is an on-going process. The project, however, has made significant advancements in the right direction and has laid down much of the basis (strategies and mechanisms) for the process to continue on a self-sustaining way.

The project has been aware and sensitive towards involving women in its activities and has exhibited gender sensitivity in all stages of implementation. BACIP has addressed this issue in a number of ways; clarifying project objectives, emphasising promotion of products specific women needs, mobilising community women and giving them specific responsibilities as resource persons and employing awareness raising techniques specifically aimed at women. Ensuring equitable women development, integration and participation are, however, long-term objectives for which consistent and long-term interventions are required. Women have no doubt been direct beneficiaries of most of the BACIP products and considerable improvements have been noted in their material comfort and ease in performing their productive and reproductive roles. But making them active participants of the project and fulfilling their strategic needs and addressing gender imbalances is something that remains to be achieved. This point is elaborated in more detail in remaining sections of the report. The last objective of disseminating BACIP research and training to a wide selection of audience (NGOs, government organisations and professionals) has been achieved to a great extent given the limited time frame available to the project.

### 3.2 Patterns of Adoption of BACIP Products

The standard reporting system used by BACIP reports on the number of products adopted rather than the number of households adopting BACIP products. In this evaluation, however, the emphasis is on estimating the number of households adopting various products, because this is the main indicator used in studies of innovation diffusion for estimating behavioural change and tangible impacts. Household level records of adoption do exist at BACIP, and BACIP provided some summary statistics on these at the request of the evaluation team. These statistics relate to:

- ú The overall household adoption rate for BACIP products, after one year, in the Gilgit and Nathiagali Regions of the GEF/SGP project area, and the mix of products adopted (fuel-efficient, structural and other).

- ú The product-by-product adoption rate for a large number of products in village Ghulkin, where BACIP has been active for almost three years.

Relevant statistics from the GEF/SGP project area are summarised in Table 3 and Figures 1, 2 and 3. Available statistics from Ghulkin village are presented in Table 4 and Figure 4. The main findings from these data are summarised below:

Table 3: Adoption Rate and Product Mix in UNDP Project Area, after one year (2002 -2003)				
Region/Village	Percent of Village Households Adopting BACIP Products	Percent of Total Products that Are :		
		Fuel Efficient	Structural	Other
<b>Gilgit</b>				
Singal (Central only)	10.7	80	0	20
Rahimabad	7.7	88	0	11
Sonikot	8.0	88	3	7
Gilgit Town (Suburbs only)	7.3	59	4	36
Chipurson (Rishit, Sher -e-Sabz)	15.8	44	0	55
Phunder	19.2	82	3	13
Serbal	16.3	92	3	3
Average for Gilgit	10.4	70	3	27
<b>Nathiagali</b>				
Tauhidabad	66.7	97	0	3
Mallach	5.1	100	0	0
Dongagali	78.3	91	0	8
Khandkallam	0.1	100	0	0
Nathiagali (Road side rural only)	5.0	33	33	33
Kerisafli	0.4	100	0	0
Average for Nathiagali	7.5	95	1	4
Source: BACIP data reproduced in Annex Table 1.				

- ú 10.4 percent of the households of the Gilgit Region and 7.5 percent of the households of the Nathiagali Region adopted BACIP products. This adoption rate includes the demonstration products (or models) installed free-of-cost by BACIP. In Ghulkin village, however, where BACIP has been active for a longer period, at least two products—the roof hatch window and the combination of fuel-efficient stove with the water warming facility—have been adopted by almost one-half of the households. This illustrates how results tend to improve with time for some products, and similar trends are visible in some of the other villages in which BACIP has been active for some time.
- ú Not surprisingly, there is a considerable amount of village-to-village variation in the adoption rate. Discussion with BACIP suggests that there may be good reasons for this variation, but available documents do not explore this issue systematically.
- ú The product mix in Nathiagali is more heavily skewed in favour of fuel-efficient products than in Gilgit: 95 percent of the products adopted in Nathiagali, and 70 percent in Gilgit, are fuel-efficient products. The adoption of structural products is negligible in both regions, while household and other products account for 27 percent of the products adopted in the Gilgit Region. As data from Ghulkin village show, even after three years,

only a small proportion of the households have adopted structural and household products.

- ú Even after three years, as the Ghulkin data show, only five products have attained a double-digit adoption rate. Three of these five products—the fuel efficient stove, the water warming facility and the chimney—are related to each other by design. The fourth product that has done well is the roof hatch window, which is particularly useful in cold, high-altitude locations.

Product	Percent Households Adopting	Percent of All Products Adopted <sup>1/</sup>
<b>Fuel-efficient Products</b>		
Roof Hatch Window	47.2	16.0
WWF set complete (stove)	43.9	14.8
Fuel-efficient Stove	25.2	8.6
Wall Insulation	18.7	6.3
Feri ferri (chimney smoke control)	13.0	4.3
Double Glazed Windows	9.8	3.2
Polythene Sheet (roof insulation)	5.7	1.9
Floor Insulation	4.9	1.7
Double Glazed Windows (south)	0.8	0.2
Roof Water Proofing	1.6	0.5
Solar Cooker	1.6	0.5
North Side Window	0.8	0.2
WWF Drum (geyser only)	0.8	0.2
		58.4
<b>Structural Products</b>		
HDGI Wire	9.8	3.2
Light Roofs	5.7	1.9
Expanded Metal Mesh (structure)	5.7	1.9
Site Plan (BACIP house model)	2.4	0.8
		7.8
<b>Household Products</b>		
Bedding Rack	13.0	4.3
Kitchen Worktop	11.4	3.8
Kitchen Cabinet	9.8	3.2
Dry Pit Composting Latrine	4.1	1.3
Plastic Pipe (kitchen drainage)	2.4	0.8
Laminated Glass (for hatch window)	1.6	0.5
		13.9
Notes: 1/ Chairs and tables introduced at a village school have been excluded from the product total.		
Source: Annex Table 2		

Figure 1: Adoption Rate of BACIP Products in UNDP Project Area - Gilgit Region Villages

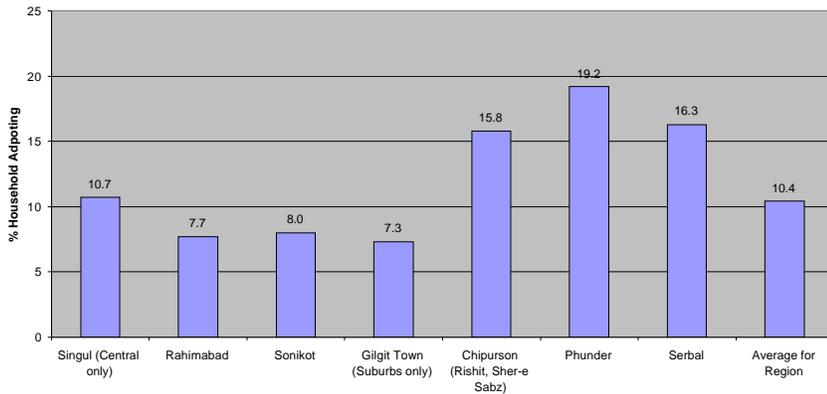


Figure 2: Adoption Rate of BACIP Products in UNDP Project Area - Nathiagali Region Villages

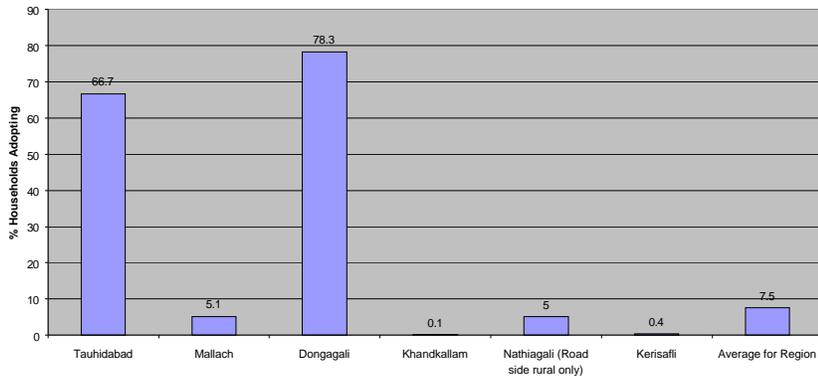


Figure 3: Product Mix Observed in the UNDP Project Area (percent of total products adopted)

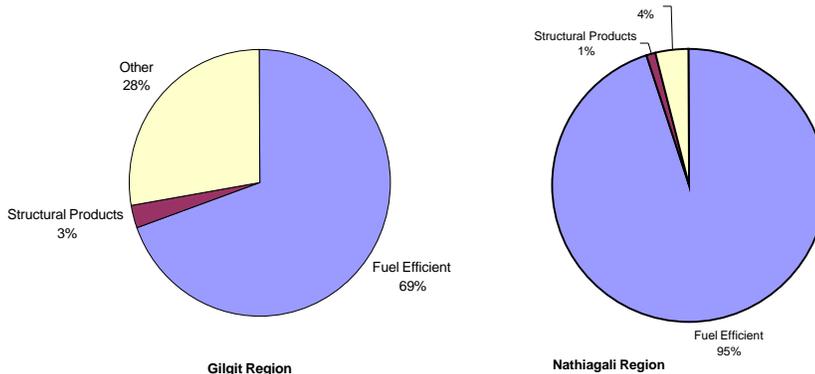
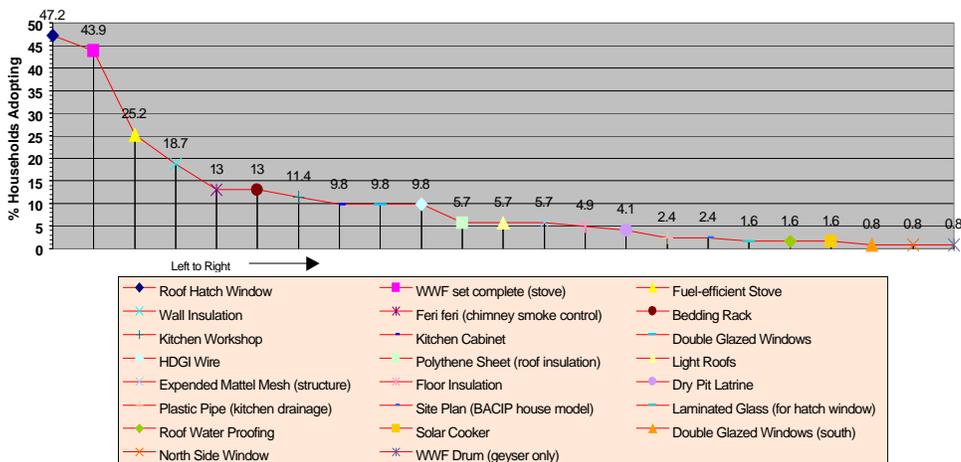


Figure 4: Adoption Rate of BACIP Products in Ghulkin Village



### 3.3 Impact<sup>1</sup> of BACIP Products

#### 3.1.1 Fuel Efficiency and Environment Conservation

The following section gives an account of some of the visible and significant impacts of the BACIP products that have been installed or replicated so far<sup>2</sup>. The impacts are observable at the household and local level and are, therefore, also described in the same manner. National and global level impact cannot be gauged through this exercise in a way that is credible and supported by existing data. Some inferences can, however, be made from the trends emerging so far (Annex Table 6 presents rough estimates for reduction in carbon emissions).

BACIP has commissioned various studies in recent years to determine the impact of the fuel-efficient products and interventions on promoting fuel efficiency and environment conservation. All have reported significant improvements in this regard, concluding that the consumption of fuel wood and timber has reduced considerably and the rate of deforestation would slow down. This impact can be attributed mainly to the use of a few products, particularly, the fuel-efficient stove, water warming facility, roof hatch window (in Gilgit only) and to some extent wall insulation.

Reports from the Northern Areas indicate that these interventions could help reduce the demands on forests by 60 percent<sup>3</sup>. The average annual fuel wood consumption amounts to 1.1 million cubic metres per year. BACIP interventions are saving up to 12 to 60 percent fuel wood at the domestic household level. Impact studies indicate an average saving of 60 percent of fuel wood per household annually, or 2.8 tonnes of fuel wood per year<sup>4</sup>.

In Gilgit the FES and WWF seem to have picked up at a great speed and households have reported considerable reductions in fuel wood collection and usage, whereas in Nathiagali, the Gilgit version of the stove did not gain acceptance until modifications were introduced over time suitable to the local requirements. Until November 2002 the adoption of the old (Gilgit) model remained very limited and its overall fuel efficiency was reported to be very low by the users. Households using the old model reported that their wood consumption actually increased. Since November, the local trained entrepreneurs, with input from BACIP, have introduced several modifications and alterations in the original stove dimensions, material, etc. to suit people's needs and only recently this new "Nathiagali" FES model is said to be picking up. BACIP provided the basic technical know how on the four major components that are important in the making of a stove for ensuring thermal efficiency and the rest of the alterations regarding size and shape came from the people themselves. This changed version is, however, efficient and there is a reported to be a 50 percent reduction in the consumption of fuel wood. Of course, most households in Nathiagali have still not replaced their traditional stoves or open fire practices with the FES due to a number of reasons. These include personal preferences, psychological barriers in the form of resisting adoption of new technologies or practices and/or technical barriers that manifest themselves due to lack of information about BACIP products or their correct usage. More realistic and visible estimates in fuel wood reduction and deforestation

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<sup>1</sup> The term impact in the study connotes "realised" and not "potential" impact.

<sup>2</sup> Annex Tables 1, 2 and 3 list the costs and benefits of fuel -efficient, structural and other products, respectively, as viewed by BACIP.

<sup>3</sup> From "Fuel Wood Consumption Practices ... Impact on Conservation of Forests and Wood Resources in the Northern Areas of Pakistan." WWF -P, AKPBS,P. July 2001.

<sup>4</sup> From "Fuel Wood Consumption Practices, Interventions for Fuel Wood Conser vation at the Domestic Household Level and Relative Impact On Conservation of Forests and Wood Resources in the Northern Areas of Pakistan." July 2001.

can be made after one whole winter season has passed and people have had first hand experience of seeing reductions in consumption of fuel sources.

Fuel wood consumption in Nathiagali has reached an all time high this year because of unprecedented harsh winter conditions and heavy snowfall. BACIP has worked here in partnership with WWF-P and NRCP for the dissemination of FES. WWF-P gives a subsidy of Rs 300 on each FES (Rs 700 per stove) and has used this as an incentive for other interventions in their ethnobotany project. In many instances it was observed that WWF-P and NRCP had allegedly given away the products free of cost. WWF-P has replicated some 200 BACIP stoves here and NRCP has replicated 275 stoves. Wall and roof insulation have not been adopted so far and where installed as a model, households claim that these can only work in conjunction with the floor insulation and fully insulated walls. These interventions are also considered expensive by some of the community members.

In Gilgit the percentage of efficiency is 46 percent for those using the FES plus WWF and 35 percent for those using the RHW. In Nathiagali, the percentage of efficiency for households using the FES plus WWF is 40 and 20 percent for those using only the FES.

Among other fuel-efficient products, the roof hatch window in Gilgit can be cited as a highly efficient thermal and fuel-efficient technology that is reported to have significant impact on lowering the firewood and heating expenses. Less smoke, improved ventilation and lighting, lesser blackening of walls and reduction in dust, smoke and soot are some of the positive impacts on the community. The wall insulation techniques (plastic foil, expanded metal wire and other materials) have reportedly reduced wood consumption of a typical family by 50 percent, thus reducing the cost and time spent on collecting and buying firewood<sup>1</sup>. It is to be noted though that households visited in Nathiagali with wall insulation have not reported any visible change in conserving heat energy within the household or reducing fire wood consumption. The explanation for this, given by the users, is that, firstly, wall insulation done for a part of the walls alone cannot lead to any visible changes, and secondly, that this intervention can produce the desirable impact if supplemented with other fuel-efficient, thermal products like the floor insulation, roof water proofing and/or insulation. It is also documented<sup>2</sup> that a combination of two to three housing improvements is expected to have a greater impact on the household energy and health conditions. Double glass window is a useful intervention but has not been able to carve out a significant place for itself among the communities visited in the project area, although those who have it have stated improvements in energy requirements. It is to be noted, however, that this intervention is effective and useful at high altitude areas only.

All these trends in household energy consumptive patterns and behavioural changes are slow processes that gain momentum over time. They can be expected, however, to impact the usage of fuel resources and environment in a positive manner in terms of reduced timber/fuel wood requirement, taking the pressure off the forests, reduction in greenhouse gas emissions, improved agricultural yield, and reduced desertification and global warming.

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<sup>1</sup> WWF and BACIP. July 2001. "Home Conservation: Integrating Environment and Development at the Household Level in the Northern Areas."

<sup>2</sup> From "The Impact of BACIP Interventions on Health and Housing in the Northern Areas," Pakistan. AKHS,P and AKPBS,P. July 2001.

### 3.1.2 Expenditure Reduction and Income Generation

Expenditure reduction is being addressed in the following ways through the adoption of BACIP technologies:

1. Reduction in the purchase of fuel wood for cooking and heating purposes. Currently fuel wood is being purchased at approximately Rs 130 per maund in Gilgit with 42 percent people buying and 58 percent collecting wood. An average household consumes 4,925 kg in six winter months. The per day consumption of fuel wood in Gilgit has been lowered from 28 kg/day to 15 kg/day for those using the FES with WWF. For those using RHW it has reduced from 28 kg/day to 18 kg/day. In Nathiagali, the price of fuel wood is Rs 80 per maund with only 20 percent buying the wood and the rest collecting it for free. Here the average household consumption is 4,200 kg of wood in a six-month cycle. Those using the FES with WWF are reporting a usage of 15 kg/day as compared with 25 kg/day used before the project intervention.
2. Reduced health bills of BACIP households. Households with BACIP improvements were monitored for two years and it was found that residents were 50 percent less sick than those of non-BACIP households<sup>1</sup>. One study suggests that houses with BACIP installed interventions experienced fewer illnesses (4.3 percent) than the non-BACIP houses (9.0 percent) and therefore BACIP has been able to reduce the disease burden by more than 50 percent<sup>2</sup>.
3. Reduced recurrent costs of repair and maintenance of houses with BACIP products especially the structural products. Earthquake resistant technologies (e.g. galvanised iron wire) give more structural stability to the house and protect it against natural disasters. The adoption of these products is still on a small scale.

The impact of BACIP products on income generation and increased productivity levels can be observed in the following ways:

1. Sixty-two people have been trained under the programme as entrepreneurs. BACIP-trained entrepreneurs (eleven under the GEF/SGP grant) have been able to acquire income generating skills by manufacturing and selling BACIP products such as the FES and WWF. These entrepreneurs have been able to utilise the training skills imparted to them by setting up their own businesses and generating income; for some entrepreneurs stove making is their sole source of income. In Gilgit, an entrepreneur who is producing and selling FES has managed to set up three additional outlets and his increased working capacity and productivity is reflected in the addition of assets such as machinery and additional workforce. The daily sales volume has increased from one or two stoves to 12 – 20 stoves after the installation of machines which also reflects increased earning potential.
2. BACIP also has an impact in terms of increased employment opportunities for labourers and those in the construction business.

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<sup>1</sup> "Workshop on Partnership in Sustainable Mountain Area Development." AKPBS,P/BACIP. May 2002.

<sup>2</sup> "The impact of BACIP interventions on health and housing in the Northern Areas, Pakistan."

3. There are three BACIP-UNDP trained entrepreneurs working in Nathiagali who are manufacturing and selling FES and have managed to set up their own shops as well as training and hiring others.
4. Community based sales agents for BACIP products, although few, are now able to earn additional income by selling BACIP products.

### 3.1.3 Women

BACIP follows gender neutral (for general improvement purposes) as well as gender specific (addressing women needs and problems)policies<sup>1</sup> and practices. Its UNDP project proposal explicitly includes women's development and promoting improvement in their living conditions as a main objective. This in itself reflects a gender orientation and sensitisation that is lacking in many other projects in the country. BACIP products, interventions for community mobilisation and awareness raising all demonstrate its commitment to positively impact women development, status and empowerment issues. BACIP reports also document that BACIP has made a consistent effort to address women's practical and strategic gender needs.

Women have been given special consideration under the project and are viewed as clients rather than beneficiaries alone. This is why a number of interventions have been defined keeping in view their needs, comfort level and requirements. At least 15 of the BACIP products are considered to address specific women's needs and concerns. The project staffing pattern and the resource persons and social organisers also reflects a gender balance. Moreover, many promotional and awareness raising activities are especially geared towards women for making them direct participants in the project.

The following aspects illustrate how BACIP has positively impacted women:

1. Viewing women as active and not only passive beneficiaries of the project; BACIP's biggest contribution is bringing about a change and improvement in women's awareness level and understanding of vital issues. Road shows, bus schemes and radio programmes are very constructive and important in this respect.
2. Women play quite an active role in the decision making process and according to one report,<sup>2</sup> women's knowledge of BACIP products is very high (especially where BACIP trained entrepreneurs/craftsmen were present).
3. Cultivating women as resource persons is another step in the right direction. This gives them good exposure, builds their confidence and raises their self-esteem.
4. Making women commission agents for BACIP products creates income-generating opportunities and improves their economic status.
5. Women benefit from increased comfort level and convenience in performing household chores through use of gender specific products such as WWF, kitchen work tops, cabinets and bedding rack. These products reduce workload and free up time for more productive activities. Better time and space management, improved living conditions and

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<sup>1</sup> "BACIP From a Gender Perspective." Vol I. September 2001.

<sup>2</sup> "BACIP From a Gender Perspective." Vol I. September 2001.

thus better health and hygiene conditions are spin off benefits. It should be noted, however, that the adoption rate of these products is still very low.

6. Better ventilation, light and the ease in performing domestic chores by introducing the RHW in Gilgit also provides welcome relief to women from the centuries old traditional arrangement.

### 3.3 Constraints and Limitations

BACIP has experienced certain constraints and limitations during project implementation at the institutional level as well as the community level.

#### At the Institutional Level

All of BACIP's products and interventions are centred around introducing "new" technologies and solutions to the "old" way of doing things. This makes BACIP an innovative and ambitious project but, as in many other cases, the diffusion of certain innovations may be a slow moving and intensive process that takes time to spread on a mass scale.

One point of view is that BACIP's policy of following a non-subsidised approach, although supportive of sustainable service delivery, presents a major constraint in terms of rapid adoption and acceptability of its products. This situation is compounded by the subsidies being offered by a majority of the other development organisations already operating in the project area. The result is that even products that have proved their utility, people are not yet willing to invest in replication, in the hope that they will eventually receive the products free of cost. This was observed in a number of households in both Gilgit and Nathiagali.

As BACIP itself has suggested, it has a capacity for handling not more than 15 products at a time. The diversity and complexity of manufacturing and promoting 40 products can be and is thought to be overwhelming. After sales service and quality assurance certification by BACIP pose additional problems in large-scale replication. Products requiring extensive variations according to household requirements and geographical positions also give rise to resource constraints. Considerable time and effort is spent on research, product innovation and refinement, and this tends to divert resources from developing a stronger customer orientation.

A number of other constraints were observed during the literature review and field work for this evaluation, and these are summarised below:

- ú Centralised operations regarding taking orders, organising inputs for manufacture and making deliveries translate into a long and often cumbersome process. This is viewed as a serious constraint. Another issue is the stiff competition in the form of other contractors who have not yet understood BACIP technologies and are willing to take on construction work on a credit basis. The time interval between receipt of demand and delivery is significant and this is viewed as a serious constraint that has restricted demand. The absence of ready-to-sell stock and materials required for the manufacture of BACIP products makes it difficult to be responsive to demands from the community.
- ú Some of the more technically superior and complex products, for instance the HDGI wire and the dry pit latrine, require constant technical supervision, high level of skills (architects, master masons, etc.) for levelling and layout, which translate into

- unaffordably high costs. A commitment to quality assurance requires that none of the technical and safety standards are compromised. Strict adherence to technical standards and specifications limits production on a mass scale by the entrepreneurs.
- ú Formal sector engineers, architects and contractors are hesitant about using BACIP technologies and lack either the understanding or the technical expertise to integrate these into their working system. Although not a BACIP constraint, this impedes rapid replication.
- ú The payment procedure requiring placing of an order with 50 percent of payment paid up front can cause even a potential customer to be unable to purchase a product right away. Lack of micro financing for household products and interventions also has a restrictive influence on the product adoption rate.

### At the Community Level

The following constraints and limitations have been observed to operate at the community level:

- ú Psychological barriers that pose an instinctive aversion to new products are one of the main causes of limited replication. Old traditions, values and lifestyle choices dominate the patterns for meeting household energy requirements.
- ú Technical barriers become more pronounced due to low literacy levels and the resultant lack of understanding of the product details, benefits and proper operation and maintenance.
- ú Problems regarding repair and maintenance, e.g. in double glass windows and RHW, may also discourage others from replicating the product at their own cost. BACIP is trying to address this problem by increasing awareness and introducing user manuals.
- ú Structural products that have safety impacts are not viewed as very important by the people as opposed to those who are considered as having a quick return on investment and more visibility in terms of impact.
- ú Although the products under this project break even within a two-year period, people view the cost as either being on the high side or the product not ranking high on their priority list. Low-income communities have limited financial capacity and anything beyond basic needs is considered unaffordable and therefore unacceptable.
- ú Trained entrepreneurs at the local level are seriously constrained in acquiring all supplies and materials for manufacturing BACIP products.
- ú The wait and watch syndrome is also at work; people are hesitant to make an investment themselves in the hope that they can acquire certain products for free.
- ú Adverse weather conditions in Nathiagali, poor roads and inaccessibility of the far flung households makes it very difficult for carrying out awareness raising, regular visits and service delivery.
- ú Communication with women members due to cultural and religious constraints often makes it difficult to get women to play an effective role as resource persons and product promoters.
- ú Social and cultural patterns, for instance the extensive use of wood in roofing structures in Giligt and the non-acceptance of a RHW in Nathiagali pose obstacles in product promotion.

## 4. Future Directions

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### 4.1 Project Sustainability

This section looks at the sustainability of the BACIP products promoted under the project in terms of their self-sustaining capacity and the social and economic viability as well as the case may be. According to a study the average payback period for the FES, RHW, wall insulation and roof waterproofing is less than two years and these products are reported to be economically viable and within financial reach of most people. It further states that wall insulation, 100 percent costlier than that of RHW, displays 50 percent more fuel wood savings and a possibility for reducing the price of the product up to 33 percent through the use of local materials and labour. Moreover, an increase in the value of the opportunity cost of time saved by those who collected their own fuel wood would greatly strengthen the case for purchasing BACIP products<sup>1</sup>.

Almost all other BACIP products have a short payback period due to savings in costs of fuel and health as well as in house repairs. Many additional studies have mapped the demand situation and assessment of financial capacity carried out. These findings corroborate the fact that financial affordability and lack of demand of the products is not a problem and there is a lot of potential for wide scale replication of the products. For instance, future projections estimate increasing demand for the FES and the roof hatch window.

Of the existing products the FES, WWF, RHW and gender specific home improvement products can be categorised as highly self-sustaining and replicable products. The dry pit latrines and roof/wall insulation techniques are towards the lower end in terms of being self-sustaining unless cost cutting and technology simplification is incorporated in the design.

The programme has developed and is working on additional strategies and development of market based mechanisms with the ultimate aim to put in place a self-sustaining mechanism for the replication of all products and interventions. Some of these plans are discussed in the following section.

### 4.2 Future Planning and Steps for Improvement

This section pertains to the BACIP programme on the whole. Planning and improvement has remained integral to the programme at the strategic level and at the operational level in terms of refining products and interventions. Future plans are many and they set ambitious targets. The programme after having progressed from an intensive period of product research and model installation is now investigating methods of effective mass dissemination, awareness raising and improving access to quality building materials. A marketing plan has been developed for the next five years that looks at many aspects of strengthening strategies and interventions.

BACIP is working on how to make the programme more sustainable and the partnerships and cross sectoral linkages it has developed with other NGOs, projects, government as well as the private sector demonstrate this commitment. In order to increase its financial sustainability, it

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<sup>1</sup> "An Economic Evaluation of Core BACIP Products and an Assessment of Demand Determinants and Constraints." Micheal Weatherhead. August 2001.

has been making efforts to tap additional sources of funding, link up with other donors including USAID and access a financing facility. The decision to follow a non-subsidised approach and work through voluntary resource persons and co-ordinators also reflects the programme's financial sustainability.

Other examples of forming partnerships and undertaking collaborative ventures for the purpose of extending outreach, product replication and capacity building also exist. These include UNDP-GEF, WWF-P, NRCP, Apna Sehat, Plan International and some other CBOs for training, promotion and planning activities. BACIP's five year marketing strategy<sup>1</sup> focuses on development of entrepreneurs and the creation of a trading network for ensuring a sustainable system of production and sale of BACIP products at the local level. This will also address issues of cost cutting and easy repair and maintenance as well as addressing supply and demand issues and information requirements.

In terms of product replication, BACIP is estimating a goal of placing some 30,000 products in the households of Northern Areas and Chitral by delivery and replication through private sector based entrepreneurs. In its extension phase BACIP is now looking at establishing market supply and demand mechanisms, training of local entrepreneurs and wide scale marketing to generate a demand for BACIP products. The main focus for this lies on decentralising operations at the village level; developing local manufacturing and entrepreneurial skills and increased level of production at the grassroots level and outreach to remote area. To achieve this objective it will support the formation of local trading networks, setting up mobile units to cater to training needs, sub-regional centres across the project area and quality control and after sales service.

In order to better achieve its objectives and create greater impact it has also considered concentrated marketing of 10 core products and producing easy assemble-it-myself (AIM) packages that come with a step-by-step user manual. R&D activities are planned for the future with more emphasis given to implementation (improved design) issues. A BACIP product mix is also envisaged; a combination of products that can achieve greater impact on fuel conservation in the area. According to plans, BACIP will eventually withdraw itself from a production role and restrict its role to that of a facilitator; technical and managerial guidance supporting the formation of market networks and linking all its products and interventions directly with the private sector. Working through established sub-regional centres (not included under the UNDP proposal) that are facilitated in logistics, quality control, brand name, instant delivery and sustainability, BACIP will completely decentralise and delegate all responsibilities at the local level. Mobile teams can continue to be used for on-site monitoring and liaising with the Gilgit office.

Linking up with the First Micro Finance Bank (FMFB) for initiating a micro finance scheme is on their agenda next and will solve people's cash flow problems by providing them individual/group loans for replicating home improvements and addressing the problem of the agro-based cash cycles. Improvement plans for promoting/awareness raising are also being worked out. Mass dissemination and knowledge building tools like product catalogue, pamphlets, newspaper advertisements, national workshops and seminars and community sessions in post harvesting period will be utilised.

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<sup>1</sup> "BACIP Marketing Plan 2002 – 2007." September 2001.

### 4.3 Conclusions and Recommendations

Although this evaluation pertains to the BACIP and UNDP-GEF/SGP funded project these conclusions and recommendations are for the overall programme with many aspects relevant to the current project and any future ones that it may undertake.

#### Transition and Evolution

The BACIP programme methodology has undergone a number of refinements, as have the products, making it innovative and yet flexible to rapidly changing scenarios. Multiple channels of feedback from the community, users, non-adopters, strong links to networks of village and women's organisations in NA and Chitral, BACIP internal monitoring and entrepreneurs make way for a continuous cycle of generation of ideas and improvements. A more product-focused approach is slowly giving way to customer and market orientation. This means that the programme is being tailored to the consumer's needs, delivery mechanisms are non-subsidised, more demand driven and promotion and marketing efforts are being streamlined with the community's cash flow patterns. The programme has a comprehensive and systematic process for need assessment and identification of problems. It has a thorough R&D process and user feedback leading to improvements and user acceptability.

BACIP is evolving to a concept of "partners in change," focusing more on networking, establishing sales networks and development and delivery through private sector. A number of NGOs, government organisations, private sector and donor-funded projects that have common objectives are seen as potential partners or beneficiaries of the BACIP products. BACIP has made good use of resources available with NRCP and WWF-P in Nathiagali.

The project itself demonstrates an effective transition from a research and development project to applied action research, extension and service delivery. More is planned along these lines and increasing efforts are being made to develop cross-sectoral, cross-functional partnership linkages with other organisations and players in the development sector.

Studies report that significant markets for BACIP products exist in the formal sector that can be educated on the benefits of BACIP thermal, structural products. These include the government departments and implementing agencies for public goods, AKDN institutions including AKP BSP, schools, universities, NGOs, engineers and architects, and other professionals in the public and private sector involved in the construction, building, timber trading work.. It is, however, also true that formal sector engineers, architects and contractors are hesitant about using BACIP technologies and lack either the understanding or the technical expertise to integrate these into their working system. BACIP should explore ways of how it can overcome this problem.

The concept of networking and partners in change is a progressive one but BACIP stands to benefit a lot more if strong institutional linkages are forged with the AKDN institutions. AKDN alone provides for a very wide and diverse market by integrating BACIP designs and products in their ongoing and future projects and thereby lending BACIP a great degree of promotion, visibility, credibility and cost effectiveness. BACIP should also develop training modules for training other NGOs who want to initiate similar projects in areas other than BACIP focus areas.

#### Future Product Replication

In every village, BACIP emphasises demonstration of fuel-efficient products, with less emphasis on other products. Selection of other products is based on experience and judgement. The replication of BACIP products has occurred at two levels, both without any direct subsidy from BACIP, namely: (i) at the institutional level, and; (ii) at the entrepreneurial level. All future product adoption is expected to be impact-based replications with the impact showing in the second or third year of the project.

WWF-P and NRCP has replicated dry pit latrines and FES. Tauheedabad and Doonga gali represent good examples that have a comparatively high adoption rate and support from the communities has been forthcoming. Sirpata and Kundla are examples of villages where the project has been constrained and unable to achieve any significant acceptance and adoption of BACIP products.

Social and cultural patterns, for instance the extensive use of wood in roofing structures in Gilgit and the non-acceptance of a RHW in Nathiagali pose obstacles in product promotion. Changing social and economic conditions, climatic change (global warming), natural catastrophes, increased price of timber and biomass fuels and increase in literacy rate are all indications that there is immense potential for BACIP's product acceptability and adoption in the years to come. The issue of affordability is well addressed in the report<sup>1</sup> stating that despite low incomes, a very large proportion of households in the BACIP programme area, are in a position to generate savings even after making capital investments. A micro finance scheme, revolving fund or utilising community's internal savings and directing it to home improvement products on easy terms and conditions can, however, greatly enhance the adoption rate.

Moreover, various studies have indicated the presence of a large market for BACIP products and have quoted constraints in supply and information channels rather than demand. The issue of quality control is crucial for the purposes of future replication and sustainability. But more importantly, it is noted that under the present range of products, BACIP may not be able to do justice to all and benefits and impact will be diffused and spread too thinly.

Bringing about attitudinal and behavioural changes in people is a long process. Successful dissemination and achieving a high adoption rate is labour and time intensive and should be coupled with strong demonstration effects, intensive and regular follow ups and constant motivation and awareness raising activities.

It is recommended that BACIP follow a more focused and concentrated approach in terms of its product line. In any population domain characterised by common features, it should take up pilot testing of not more than five products at a time and add to these only once all five have been fully accepted and replicated by the community. BACIP should organise an adoption survey of its key products and make credible future predictions according to people's stated preferences and product prioritisation. The current practice of promoting all products at the same time, does not allow room for the best and most viable products according to impact and need, to be established in the market (Zaidi, 2001).

A narrower product range can be better managed with higher level of product details and benefits explained to the community; ease in purchasing raw materials in bulk, responsiveness to customer feedback and changing requirements, ease with follow up and after sales service.

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<sup>1</sup> "Socio-Economic Constraints and Potentials for Wide Scale Replication of BAC IP Products in Northern Areas and Chitral Region of Pakistan." An Evaluation by Akbar Zaidi. September 2001.

BACIP gives good analysis to explain why a technology is or isn't adopted. It does not, however, have systematic or statistical projections of user acceptance. It needs to undertake a statistical survey of how beneficiaries intend to adopt various products, understand differences among relevant target groups and draw up recommendation domains. Resources can be utilised more effectively and efficiently by concentrating on products that correspond well to each recommendation domain.

### Women and Communication

Women are viewed as equal shareholders in the project and strong orientation towards women's awareness is enhanced by the presence of WOs in Gilgit. and gender specific products. Effective programme for entrepreneurs and partners and links with VOs and WOs all promote communication. It is noted that the process of product manufacturing and distribution is currently a male dominated arena and although women will benefit in their practical needs, their institutional capacity building and empowerment will remain unmet unless they are integrated in all steps of the project cycle.

The role of the female resource persons has to be made more dynamic, especially in Nathiagali, so that they can serve as an effective and consistent link with BACIP, traders network etc. These resource persons can be encouraged to get more involved in the process of sales and distribution centres. Gender sensitisation of the entrepreneurs and regional traders is one area that needs more focus and attention in order to make this possible.

Awareness raising should focus on linking BACIP product benefits with a broader context relating to national and global levels. Operation and maintenance aspects, the rationale and not just the impact of the products should be explained to women in greater detail and in simple terms so that they can understand the products. Step by step user manual and instructions can be very useful.

A comparative analysis with traditional techniques and practices is required. It is important that the people are made to see the benefits of using a fuel-efficient stove for themselves in terms of the saving in time, effort, money, and positive impact on their health and their environment. Only then is it realistic to expect changes in local behavioural patterns that can be internalised and sustained.

More realistic and visible estimates in fuel wood reduction and deforestation can be made after one whole winter season has passed and people have had first hand experience of seeing reductions in consumption of fuel sources.

### Service Delivery Mechanisms

BACIP facilitates entrepreneurs through training, input supply, taking orders and making deliveries. Its systems, however, are centralised and sometimes suppress the latent demand and actual supply. BACIP can further move towards a permanent market based mechanism (private sector) by decentralising operations for procurement, manufacturing, marketing and distribution.

Creating a network of more skilled entrepreneurs and trading outfits can facilitate people by giving them a more professional, easily accessible system of service delivery. All processes like procurement, manufacturing, promotion and distribution should be decentralised to the lowest tier possible.

Even after market based mechanisms have been established, BACIP will have to maintain an overall supervisory and monitoring role to ensure that the products replicated locally meet the design and quality specifications of BACIP and are therefore not influenced by competitors or negative impacts accruing from inadequate and substandard products and installation techniques.

The provision of technical supervision for products like the pit latrine, roof and wall insulation has to be made accessible at low cost at the village levels. This will require a greater number of skilled and trained people at the local level.

#### Testing and Adaptation in New Project Areas

BACIP often responds to the need to adapt products in new project areas but does not plan explicitly for this step before demonstration. BACIP process should explicitly define user testing and adaptation as a first step in any project rather than demonstrations. R&D should be formalised as the first step at the entry level in any project area and should be carried out by BACIP. Every product needs to be compared with the local one in every new project area, then tested for user acceptance and adapted accordingly before demonstration and training.

Institutional linkages with other NGOs also require some additional work to build on the training programmes that BACIP currently offers. It would be worth it to design training programmes specifically for NGO personnel and promoters, to replace the current programmes in which NGO personnel participate in programmes that are designed essentially for entrepreneurs. It is recommended that process-based training be developed for NGO partners, the process being the complete BACIP process that has been described, in outline form, in existing reports. A practical, step-by-step elaboration of the BACIP process would be a highly useful guide for its NGO partners and others interested in replicating its approach.

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## Annex I: Terms of Reference for the Evaluation

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### 1. Background

Aga Khan Planning and Building Service, Pakistan (AKPBS, P) (formerly known as Aga Khan Housing Board) initiated Building and Construction Improvement Program (BACIP) in the Northern Areas as a research and extension Project in 1997. Since then, BACIP has been engaged in developing physical solutions (Technologies and Practices) for improving the living conditions of the people in the high mountain regions of Northern Areas and Chitral. Over the years BACIP has developed more than 60 interventions for improving the living and housing and living conditions of the mountain people which directly impact environmental conservation, improve domestic health & sanitation, women development and domestic economic benefits. BACIP Extension phase, in place since January 2001 is being funded jointly by AKF and USAID

In early 2002, Global Environment Facility (GEF), through its Small Grants Program (SGP) window, funded BACIP for a period of twelve months to undertake a short-term project with the following objectives.

1. To train local entrepreneurs in four market villages of Gilgit and Nathia Galli region each in manufacturing of BACIP products that promote fuel wood and forest conservation and improve women and children living conditions. (Identified products include, fuel-efficient stoves, roof hatch window/ double glass window, house insulation techniques, and water warming facility)
2. To promote BACIP products amongst the communities for demand generation for the entrepreneurs and acceleration of the adoption rate.
3. To promote women development and gender equity by involving women in various aspects of the project
4. To disseminate BACIP research and impart training to select NDO'S, Government agencies and Professionals (of BACIP products)

Key activities of the SGP project include,

1. Entrepreneur/ Artisan Training
2. Community level promotional activities for raising demand of BACIP products
3. Dissemination of BACIP Products, Process, and Impacts
4. Monitoring and Evaluation

The project was initiated on April 1<sup>st</sup> 2002, and will come to an end on March 31<sup>st</sup> 2003.

### 2. Purpose and Rationale

The approved project document calls for an end-of-project evaluation to ascertain the project's overall achievements/ shortcomings in implementing SGP funded activities, and suggestions/ recommendations to be drawn from it for future options.

### 3. Implementation

The evaluation will be organised and managed by AKPBS-BACIP, in collaboration with UNDP-SGP and AKF, and will be conducted by one external consultant of repute with a minimum of 10 years of experience in social development and evaluations.

#### 4. Objective of the evaluation

Specific objective of the evaluation will be to assess

1. To what extent the project objectives have been met?
2. To what extent the project activities have been accomplished?
3. To what extent the installed BACIP products promote fuel efficiency, environment conservation, expenditure reduction, income generation, and women comfort and convenience?
4. What have been the project principal achievements? How can deficiencies be overcome?
5. What are the global benefits of this project?
6. What are the prospects for replicating the projects' achievements?

#### 5. Methodology

An AKPBS team of relevant personnel, facilitated by PM-BACIP, will assist consultant in the project evaluation. General methodology to be followed by the consultant will include following steps

- a) Analysis of Project related secondary information, such as project document, progress reports, M&E reports, training reports, work plan, etc (a complete list and hard copies of the documents to be provide to the consultant) (3/4 person day)
- b) Analysis of other secondary information such as AKPBS, BACIP, UNDP-SGP related (a complete list and hard copies of the documents to be provide to the consultant) ( ¼ person day)
- c) Development of detailed checklist for each key evaluation questions ( ¼ person day)
- d) Pre-evaluation briefing by PM-BACIP in Gilgit followed by meeting with staff/ field visit to Gilgit (2 days) and Nathia galli (one day)
- e) Feedback on project activities/ benefits through primary investigation/ field visit, including feed back from BACIP product users, entrepreneurs, and the communities ( included in the field visit time period as in item (d) )
- f) Post evaluation de-briefing to PM-BACIP in Islamabad/ Gilgit(1/4 person day)
- g) Development of draft evaluation report against the evaluation objective, including draft findings and recommendations ( 4 person day)
- h) Finalization of the report after obtaining feedback and comments ( ½ person day)
- i) Presentation of the report in a national workshop in Islamabad (Tentatively scheduled for April 10<sup>th</sup>) ( ½ person day)

Total nine and half person days = say ten person days

#### 6. Reporting

The consultant will submit a succinct and fully edited report in English of no more than 10,000 words (excluding tables and figures) in a printed and electronic version. The report will include and executive summary (up to 2,000 words) and will address all the key evaluation questions as identified above. The report will also be structured to provide key findings/ conclusions for each evaluation questions as well as specific, targeted, and action oriented key recommendations. The

annex will include a description of the method used, a bibliography, list of persons interviewed and the terms of reference.

## 7. Timing

The Evaluation exercise is expected to be completed within the calendar period of March 20<sup>th</sup> – April 15<sup>th</sup>, with the draft report to be submitted by the consultant to AKPBS no later than 4<sup>th</sup> of April 2003. Final report to be submitted by the consultant at least one working day prior to holding of the national workshop.

## 8. Use of the Evaluation

Apart from the feedback to SGP on the utility and effectiveness of the such project grants, and the global environmental benefits accrued thereof through the processes and the product introduced through this project, AKPBS may wish to use the findings and recommendations of the evaluation in future strategic planning of the AKPBS programs. The results of the evaluation may be made public through UNDP website.

**Annex II:**  
**List of People Met for the Evaluation**

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<u>Name of Person</u>	<u>Designation/Organisation</u> <u>Gilgit Region</u>	<u>Location</u>
Syed Fakhar Ahmed	Programme Manager, BACIP	Gilgit Office
Karim Ullah Beg	Training Manager, BACIP	Gilgit Office
Nahida Aziz	Monitoring Officer, BACIP	Gilgit Office
Qurban Ali	Technical Field Officer, BACIP	Gilgit Office
Dukan Shah	Village Co-ordinator	Singal Village
Izat Shah	Beneficiary, Stove with Water Warming Facility	Singal Village
.Izat wali	Beneficiary, Roof Hatch Window	Singal Village
Gulsamber Khans wife	Beneficiary, Water Warming Facility, Roof Hatch Window and Shop Owner	Singal Village
Sharif	Entrepreneur - BACIP Stoves	Gilgit Market
<u>Nathiagali Region</u>		
Atif Siddique	Co-ordinator	Nathiagali
Zulfiqar	Co-ordinator, Nathia Gali	Elites Hotel
Abdullah Ayyaz	Programme Officer, WWF -P	WWF-P Office
Khalil ur Rehman	Beneficiary, Wall Insulation and Stove	Tauheedabad Village
Aurangzeb	Beneficiary, Dry Pit Composting Latrine	Tauheedabad Village
Bashir	Beneficiary, Water Warming Facility and Stove	Kundla.(Malach)
Jalil's assistant	Entrepreneur – BACIP Stoves, (met in absence of Jalil)	Kalabagh
Shoaib	Entrepreneur – BACIP Stoves	EDC Office, Islamabad

### Annex III: Statistical Tables

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Annex Table 1:  
BACIP House Improvement Adoption Rate for UNDP Project (2 002-2003) – one year only

	Total Households	BACIP covered Households	Household % coverage	Fuel efficient products	Structural products	Other products	Models	Replication	Total Products
Gilgit Region									
Singul (Central only)	150	16	10.7	20	0	5	9	16	25
Rahimabad	130	10	7.7	16	0	2	9	9	18
Sonikot	150	12	8.0	23	1	2	7	19	26
Gilgit Town (Suburbs only)	450	33	7.3	65	5	40	15	95	110
Chipurson (Rishit, Sher -e-Sabz)	95	15	15.8	16	0	20	1	35	36
Phunder	120	23	19.2	24	1	4	0	29	29
Serbal	80	13	16.3	26	1	1	0	28	28
Total	1175	122	10.38	190	8	74	41	231	272
Nathiagali Region									
Tauhidabad	150	100	66.7	97	0	3	16	84	100
Mallach	661	34	5.1	34	0	0	14	20	34
Dongagali	60	47	78.3	43	0	4	10	37	47
Khandkallam	1350	2	0.1	2	0	0	2	0	2
Nathiagali (Road side rural only)	20	1	5.0	1	1	1	3	0	3
Kerisafli	245	1	0.4	1	0	0	1	0	1
Total	2486	185	7.44	178	1	8	46	141	187

Annex Table 2  
Year wise Summary of Ghulkin (Total 123 houses, and all covered with 2+ products)  
(Sample for 3 years of work for coverage of village from December 2000 – February 2003)

S#	Item	2000		2001		2002		2003		Cumulative Total		Grand Total	% From Total Products	% From 123 Households
		Model	Replication	M	R	M	R	M	R	M	R			
1	Bedding Rack	1	2	0	5	0	8	0	0	1	15	16	4.4	13.0
2	Fuel-efficient Stove	1	3	0	7	0	15	0	5	1	30	31	8.5	25.2
3	Double Glazed Windows	0	0	0	12	0	0	0	0	0	12	12	3.3	9.8
4	Floor Insulation	0	0	1	3	0	2	0	0	1	5	6	1.6	4.9
5	HDMI Wire	0	4	8	0	0	0	0	0	8	4	12	3.3	9.8
6	Roof Hatch Window	1	3	0	24	0	30	0	0	1	57	58	15.9	47.2
7	North Side Window	1	0	0	0	0	0	0	0	1	0	1	0.3	0.8
8	Plastic Pipe (kitchen drainage)	0	0	0	0	0	3	0	0	0	3	3	0.8	2.4
9	Dry Pit Latrine	0	0	1	0	0	4	0	0	1	4	5	1.4	4.1
10	Light Roofs	0	0	0	1	0	6	0	0	0	7	7	1.9	5.7
11	Roof Waterproofing	1	0	0	0	0	1	0	0	1	1	2	0.5	1.6
12	School Chairs 1/	0	0	0	0	5	54	0	0	5	54	59	16.2	1.0
13	School Tables 1/	0	0	0	0	2	8	0	0	2	8	10	2.7	1.0
14	Double Glazed Windows (south)	1	0	0	0	0	0	0	0	1	0	1	0.3	0.8
15	WWF Set Complete (stove)	0	1	0	34	0	17	0	2	0	54	54	14.8	43.9
16	Wall Insulation	3	0	0	8	0	12	0	0	3	20	23	6.3	18.7
17	Polythene Sheet (roof insulation)	1	0	0	2	0	0	0	4	1	6	7	1.9	5.7
18	Feri ferri (chimney smoke control)	1	0	0	15	0	0	0	0	1	15	16	4.4	13.0
19	WWF Drum (geyser only)	0	0	0	0	0	1	0	0	0	1	1	0.3	0.8
20	Expanded Mattel Mesh (structure)	0	0	0	0	0	7	0	0	0	7	7	1.9	5.7
21	Laminated Glass (for hatch window)	0	0	0	0	0	2	0	0	0	2	2	0.5	1.6
22	Site Plan (BACIP house model)	0	0	0	0	1	0	1	1	2	1	3	0.8	2.4
23	Solar Cooker	0	0	0	0	0	0	2	0	2	0	2	0.5	1.6
24	Kitchen Workshop	0	0	0	0	1	10	0	3	1	13	14	3.8	11.4
25	Kitchen Cabinet	0	0	0	0	1	2	0	9	1	11	12	3.3	9.8
	<b>Total</b>	<b>11</b>	<b>13</b>	<b>10</b>	<b>111</b>	<b>10</b>	<b>182</b>	<b>3</b>	<b>24</b>	<b>34</b>	<b>330</b>	<b>364</b>	<b>99.6</b>	
	Legend													
	Fuel-efficient Stove													
	Structural Products													
	Household Products													
	Years	2000 (Dec)		2001		2002		2003 (Mar)		Total				
		Model	Replication	M	R	M	R	M	R	M	R			
	Percentage	3.0	3.6	2.7	30.5	2.7	50.0	0.8	6.6	9.3	90.7			

Notes:  
1/ For one school.

Annex Table 3:  
Cost and Benefits of Fuel-efficient Products

Direct Impact	Indirect Impact
<b>Roof Hatch Window (RHW), Rs 1,000 – 1,800 (as per size)</b>	
1. Average fuel wood saved is 35% <sup>1</sup>	1. Reduced work load for women and wood collectors 2. Better health 3. Saves time 4. More income generating and cleaning activities
2. Savings in terms of health bills of an average of Rs. 500 per winter.	5. Money can be spent for food and education. 6. Better health 7. Savings
3. More light in the house	8. Less eye disease for kids who go to school and other family members. 9. Cleanliness 10. Less dampness due to more sun intake 11. No light needed during daytime and energy saved.
4. Reduction in dust transmission through the hatch window	12. Less workload as reduced cleaning activities for women. 13. Better health due to cleanliness
5. Stops rain leakage	14. Less dampness 15. Comfortable home 16. Less workload for women due to going on the roof and closing the roof opening with plastic sheets. 17. Less diseases (cold related)
<b>Wall Insulation Techniques (5 types), Rs 12 - 26/sft</b>	
1. 50% and more savings of actual amount of firewood used. 2. Saving substantial time in collecting and chopping firewood, and fuelling the stove	1. Reduced work load for women and wood collectors 2. Better health 3. Saves time 4. More income generating and cleaning activities
3. Considerable less space required for firewood storage.	5. More space available for other activities, vegetations or storage of fodders etc.
4. Less smoke due to less firewood used.	6. Less eye diseases. 7. Less repairing/clay wash of internal walls. 8. Less washing of clothes, bedding and utensils.
5. Less chronic cold diseases and related under nourishment	9. Reduction in health bills. 10. Better health for women and children and other family members.
6. For an increasing number of people, lower expenses for purchasing/collecting firewood.	11. Less workload for fuel wood collectors and buyers. 12. More savings of money and firewood.
<b>Fuel-efficient Stoves (6 types), Rs 600 – 11,00</b>	
1. Less fuel wood used 12% to 50% depending on the type of stove.	1. Reduced work load for women and wood collectors 2. Better health 3. Saves time 4. More income generating and cleaning activities
2. Reduction in smoke in the house	5. Less eye diseases. 6. Less repairing/clay wash of internal walls. 7. Less washing of clothes, bedding and utensils
3. Comfortable to be used in summer due to removable terracotta tiles	8. Comfortable to cook food in summer for women.
4. Increased durability	9. Money saved due to use of quality materials. 10. Long life time and saves time to make two for the same period
5. Two to three types of food can be	11. Saves time, energy and fuel wood.

<sup>1</sup> "An Economic Evaluation of Core BACIP Products and An Assessment of Demand Determinants and Constraints." Michael Weatherhead, BACIP, August 2001

Annex Table 3:  
Cost and Benefits of Fuel-efficient Products

Direct Impact	Indirect Impact
cooked at a time	12. Time can be spent on cleanliness and other income generating activities.
6. Water heating facility	13. Saves firewood used to heat water for washing, drinking (animals) and bathing. 14. More cleaning and washing activity, results in better health and hygiene 15. Reduction in paying for electricity
7. Improved chapatti plates.	16. Reduction in smoke 17. Reduction in firewood use 18. Saves time. 19. Less eye diseases, need to wash clothes etc.
8. More cleanliness	20. Chimney cleaning brush, easy to keep the chimney pipe clean. 21. Facility to clean ash and temper
Water Warming Facility with smokeless stoves, Rs 1,900	
1. Saves 50% fuel wood for heating and cooking. 2. Does cooking, heating, and water warming at the same amount of time.	1. Saves time for women chores and wood collection. 2. Warm water available for whole family for domestic use.
Roof Treatment Techniques, Rs. 800 per village house roof of 24 x 20ft.	
1. Improves thermal efficiency of the house. 2. Reduces roof dampness and leakage 3. Roof used for other activities e.g. drying apricot and other fruit 4. Reduces repairing cost	1. Better and comfortable house. 2. Saves fuel wood 3. Reduces work load 4. Reduces cold in the house. 5. Increases lifetime of wood used on the ceiling. 6. Time, energy and money saved from time to time repairing. 7. Reduced worked load 8. Clean and dust free food preservation.
Solar Cooker, Rs 1,800	
1. Saves 100% fuel (wood or kerosene) and uses direct sunlight without any batteries etc. 2. No air pollution. 3. Easy to operate.	1. Saves time fro women for cutting wood or arranging fuel etc for cooking.

Annex Table 4:  
Cost and Benefits of Structural Products

Direct Impact	Indirect Impact
<b>Galvanized Iron Wire (HDGI) reinforcement for walls, Rs 4,000 for a room of (20x 16ft)</b>	
1. Reduction in the amount of wood used for buildings. (Reinforcement)	1. Reduction in forest depletion.
2. Saves human life against seismic jolts.	
3. Earth quake resistance houses	2. Disaster mitigation
	3. Saves money from building repairing and cracking
4. Increase in multi-storey buildings	4. Saves agriculture land.
5. Peace and tranquillity	5. No fear of earth quakes at night
<b>Light Roof, Rs 7,000 per roof (24x 20ft)</b>	
1. Earthquake resistance.	1. Disaster mitigation
2. Saves traditional wooden beams of timber by 60%.	2. Saves money from building repairing and cracking
1. Reduction in the amount (60 % from the traditional roof) of wood used for buildings	3. Reduction in forest depletion.
2. Saves money and time due to low cost	4. Savings on building costs
	5. Saving in time for building a house.
<b>House Planning Tool</b>	
1. Well planned houses	1. Future needs and present space needs taken well into account .
2. Women and all family members making decisions on planning, designing and construction of a house.	2. The need of all the family members are taken into account e.g. need of students and children under 5
	3. Cost and designs are well planned
	4. Thermal issues, ventilation, illumination and space management considered at the beginning.
	5. The need of all family members taken into account.

Annex Table 5:  
Cost and Benefits of Household Products

Direct Impact	Indirect Impact
Household Furniture (bedding rack, kitchen cabinet, kitchen worktop, chairs, tables, grain storage etc), Rs 600 - 900	
<ol style="list-style-type: none"> <li>1. Better space management.</li> <li>2. High comfort and status level for women for carrying out household chores.</li> <li>3. Clean utensils and beddings</li> <li>4. Bedding stays dry</li> </ol>	<ol style="list-style-type: none"> <li>1. Utensils and beddings easily available.</li> <li>2. More space available for storage of things.</li> <li>3. More utensils and beddings stored in a small place</li> <li>4. Beddings stays clean and damp free</li> <li>5. Utensils are out of flies and reach of children.</li> <li>6. Utensils are out of flies and reach of children.</li> <li>7. Beddings are damp free and hence improve the living conditions.</li> <li>8. Beddings are away from insects and mice.</li> </ol>
BACIP Dry Pit Composting Latrine, Rs 10,000 with blocks and Rs 2,000 for ceramic and slab	
<ol style="list-style-type: none"> <li>1. Clean and safe sanitation facility</li> <li>2. Improved health and hygiene.</li> <li>3. Privacy for women</li> <li>4. Better hygienic behaviors</li> <li>5. Reduced worked load for women</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduction in Diarrhoea, intestinal worms, typhoid, Hepatitis B, Eye diseases and skin diseases.</li> <li>2. Improved domestic environment.</li> <li>3. Women and children have access to sanitation facility.</li> <li>4. Women and children have access to bathing facility, where there are communal baths for men</li> <li>5. Women and Children can relief themselves when ever they Want and need.</li> <li>7. Time saved to search for a private place for defecation.</li> <li>8. More hand washing practices due to availability of water.</li> <li>9. More bathing due to availability of bathing facility.</li> <li>10. Less water fetching as less water is needed.</li> <li>11. Manure is composed that is why easy to traffic from the vault to field and then spread in the filed.</li> </ol>

Annex Table 6.1

BACIP Fuel Efficient Stoves with Water Warming Facility  
Estimation of Potential Carbon Credits – Basic Project data for 2,500 households

	<u>Kg/ month</u>	<u>Kt/ year</u>
Fuel wood consumption (without project) (average of Gilgit @ 28 kg/day and N/gali @ 25 kg/day)	1,987,500 kg / month	23.8 Kilo ton/year for 2,500 households
Fuel wood consumption (with project) @ 15 kg/day	1,125,000	14
Fuel wood consumption avoided	862,500	10

Source: BACIP Head Office, 2003

Annex Table 6.2

Estimation of Emission Reduction

Fuel wood consumption (avoided) (kt/ year)	10
Carbon fraction (a)	0.50
Annual carbon reduction (kt C)	4.9
= Fuel wood consumption avoided x carbon fraction	
Base line carbon emission before project	11.8
= fuel consumed before project x carbon fraction.	

Notes: The range for carbon fraction values is usually between 0.43 to 0.58. The default assumption of 0.5 fraction used as per IPCC guidelines (IPCC GHG inventory Reference Manual -1996/p 5.31)

Annex Table 6.3

Emission Base Line Projections\*

Year	Accumulated Values (kt C/ Annum)		Avoided Em's
	Base Line Em's	Reduced Em's	
0	0	0	0
1	11.8	4.9	5
2	24	10	10
3	36	15	15
4	48	20	20
5	59	25	25
6	71	30	30

\* assumption: 6 years product life