Practical Guidance for Scaling-Up of Sustainable Buildings and Energy Projects

A review of good practices and lessons learned from cold regions in Asia

geres   bshf

In rural areas of cold regions in Asia, livelihoods are linked to household energy. Women spend two months a year collecting biomass; income activities are limited in winter due to the cold conditions and the smoke emitted by stove causes lung disease. Scaling up of energy efficient building techniques contributes therefore to improved livelihoods for rural communities.

Many good and comprehensive technical books have been published since the 1980s on energy efficient techniques in cold regions of Asia, targeting engineers, technicians and craftsmen. However, the literature related to energy efficient buildings and renewable energy systems is very limited in respect of project management and scaling methodology. This book aims to fill this gap by providing guidance on good practices in scaling up energy efficient buildings.

Sylvain Koch-Mathian, the author, spent one year visiting and studying several projects related to household energy and energy efficient buildings in cold regions of Asia. These projects were located in rural areas of Mongolia, the Indian Himalayas, China and Nepal. They were implemented by government agencies and international organizations, as well as NGOs. Each project was visited in the field and discussions were held with both the project team and the beneficiaries. The methodology, results, reasons for success and failure as well as lessons learnt were studied in depth.

This book provides the results and analysis of these case studies. It sets out the theory of how to design a scaling project for energy efficient buildings and renewable energy systems, as well as practical tools for implementation. The theoretical part presents a detailed methodology for designing, monitoring and evaluating a scaling up project for energy efficient buildings and renewable energy systems. This methodology is illustrated and enhanced with practical examples based on good practices observed in the field. Each step of the design and implementation of the project is facilitated by a tool kit with practical examples. Full details of each project are set out in the Appendix which also includes case study in Afghanistan where GERES has been working since the last ten years on household energy.

Project managers and decision makers are often skilled and experienced in rural development projects, but they are not usually familiar with housing or energy efficient projects. This book will enable them to design and implement scaling up projects for energy efficient buildings and renewable energy systems. It will also provide guidance to engineers and technicians who are not familiar with rural development projects and related scaling up issues.

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/ Content

/ Boxes

Energy is central to sustainable development and poverty reduction efforts. Billions of people suffer from a lack of access to affordable and modern energy and related basic services and are living in unhealthy houses. Renewable energy and bioclimatic architecture represent cost-effective, social and environmentally friendly alternatives to improve the living conditions of rural people. There are currently a number of NGOs, firms and authorities that are working for the development of cost effective, social and environmentally friendly solutions based on energy efficiency and renewable energy. Although many projects demonstrate that appropriate solutions can successfully address energy issues while improving living conditions and families' livelihoods, most of them **are facing significant difficulties to mainstream the innovation.** In addition, few publications deal with the scaling-up of sustainable buildings and energy projects and there is no documentation that provides decision makers and practitioners with practical guidance to set-up scaling-up strategies for such projects.

For all these reasons, SAESUp project (Sustainable Architecture & Energy Scaling-up) has been initiated in order **to capitalize on, consolidate and share knowledge and know-how related to these emerging issues.** Based on both literature review and lessons learnt from the six case studies[1], **it analyses key dynamics that allow for the scaling up process to happen and explores possible paths and drivers to replicate and mainstream an innovation.**

This manual aims at providing project developers and decisions makers with practical guidance regarding how to design a Scaling-Up Strategy for Sustainable Energy and Buildings projects.

Scaling-up is an open-system where necessary tasks are heavily influenced by environmental factors: political and cultural context, social capitals and capabilities as well as institutional capacities. Thus, before starting any scaling up project, it is essential to identify these elements, as well as to assess the maturity of the innovation to be scaled-up. The following key questions will need to be answered: WHAT is being scaled-up, WHO will lead the process, WHERE it will occur and HOW scaling-up will be achieved.

All this preliminary work is primordial and should be done with the objective to create a **common vision** amongst all the stakeholders.

Subsequently, strategic choices have to be made to successfully scale-up the innovation. In the present study, these strategic choices are built upon six **levers**: (1) **create an enabling institutional and political environment,** (2) **generate a demand for the innovation,** (3) **strengthen the offer,** (4) **mobilise financial resources,** (5) **set-up efficient organisations and networks as well as** (6) **monitor and evaluate the impact to adapt the strategy as scaling-up proceeds.** Key findings and recommendations are detailed in the figure on the next page. At this stage it is important to point out that "ready-to-use" or "widely-applicable" recipes for scaling-up do not exist and that project developers have to design of their own and unique scaling-up strategy based on the innovation's intrinsic characteristics as well as on the local context specificities and needs.

Scaling-up is a form of systemic change that requires reaching an agreement amongst many stakeholders (legislators, activists, service providers, private companies, donors, etc.) and turning it into actions. Each action (e.g. trainings, certification, community meetings, etc.) will be carried out thousands of times. Thus, a very good internal organisation based on a **logistics management** system is required.

Once the scaling up project has been implemented for several years, the **innovation may have reached a sufficient scale to be able to keep developing itself sustainably.** The implementing organisation will need to smoothly withdraw its technical and financial support, focusing on strengthening a sustainable and self-reliant market for the model. To do so, a comprehensive **exit strategy** is necessary.

1. Domestic biogaz (Nepal), straw-bale buildings (Mongolia and China), passive solar housing (India), energy efficiency in building sector (Nepal and China). All cases studies are included in the enclosed CD and can be download here: www.saesup.org

/ Executive summary
Key findings to implement
scaling-up strategy

Create an enabling political, legal and institutional environment

- Advocate the models' comparatives advantages to national and local authorities
- Foster supportive policies (fiscal, land policies, regulation, programming, etc.)
- Assess the relevance of working on laws, norms and standards depending of models' specificities

Monitoring & Evaluation

- Set-up monitoring systems based on "SMART" indicators in order to provide project coordinators and decisions makers with the needed information and feedbacks
- Determine iteratively how the environment (incl. electoral cycles) affects scaling-up rather than only once during the scaling-up process
- Set-up efficient systems for the information archiving and for the "knowledge" transfer
- Plan specific financial and human resources for project's post-evaluations

Institutional set-up and Networking

- Carefully define the project institutional set-up as it guarantees that each activity is carried out as efficiently as possible
- Setting-up successful partnerships and networks is essential but time consuming.
- Be vigilant to the coordination between likeminded organisations as it quite often isn't a matter of course
- Develop a holistic approach by setting-up partnerships/networks with institutions working on different issues/sectors
- Foster the setting-up of efficient Public-Private Partnership
- Organise private companies in associations/networks

Innovation financing schemes

- Subsidy mechanisms support strategic choices and orientations
- Foster users "in kind" participation rather than trying to fully or highly subsidize projects which may be counterproductive
- Assess existing innovative incentives mechanisms
- Introduce financing schemes to cut-down the interest rates
- Build capacities of MFIs on basic technical issues and risk assessment (incl. certification mechanisms) and provide them with technical support.
- Create shared risk accounts and refinancing facilities
- Develop fiscal mechanisms such as tax exemptions, land policies and/or additional tax on traditional fuels.

Support Demand Generation and Innovation Promotion

- Target group identification is essential, and it is sometimes relevant to start with an "intermediary target group"
- Tailor the innovation to social and cultural context and foster quality
- Enable people to touch and feel the innovation and demonstrate it through influential people
- Demonstrate in the same sector and modalities that are expected for the following replications
- Design a comprehensive communication strategy as a two-way information flow where feedback mechanisms are indispensable.
- Set-up of a resource centre
- Pay special attention to how to link demand and offer

Strengthening the Offer

- Fit innovation to local competencies and practices to limit the degree of change implied.
- Provide trainings for each typology of stakeholders in partnership with existing training providers and educational institutions.
- Evaluate training by surveying trainees and analyse the feedback.
- Enable capacity building and institutional strengthening of implementing and partner organisations.
- Introduce of needed knowledge in existing educational and vocational training curriculums.
- Control, certify or label the system to guarantee quality.
- Strengthen supply chains (technical, financial and managerial capacities)
- Offer site visits and workshops to reinforce the motivation while learning from other experiences

Financial and human resources

- Establish specific funds to support the drawing of scaling up strategies
- Ensure the long term reliability and continuity of funding resources
- Carbon markets are promising but unreliable funding opportunities
- Avoid underestimating the needs in human resources and capacities as scaling-up proceeds, as they may rather increase in that phase

/ Acknowledgements

INTRO
Introduction

/ Context

Energy is central to sustainable development and poverty reduction efforts. It affects all aspects of development - social, economic, and environmental - including livelihoods, agricultural productivity, health, education and gender-related issues. Billions of people suffer from a lack of access to affordable and modern energy and related basic services and are living in unhealthy houses. In order to heat a building, cook or develop productive activities, payment must be made for fuel and/or time spent to go out and gather wood or dung. Furthermore, the use of non renewable wood fuel without energy efficient technologies for cooking and heating leads to unhealthy habitat due to the smoke emissions and has negative impacts on local and global environment. This precariousness is even more problematic in cold and mountain areas where energy needs are higher and fuel resources scarce. The poor quality of building conception and insulation imply low indoor temperature and have negative impacts on livelihood and children education.

There are currently a number of NGOs, firms and authorities that are working for the development of cost effective, social and environmentally friendly solutions based on energy efficiency and renewable energy. Although many projects demonstrate that appropriate solutions can successfully address energy issues while improving living conditions and families' livelihoods, most of them **are facing significant difficulties to mainstream the innovation.**

1 / The challenges of Scaling-Up

How can the benefits achieved in successful pilot projects be expanded to serve more people, more equitably, and over a more extended time frame?

This question perfectly summarizes the challenge faced by every organization or institution that is willing to scale up or mainstream an innovation. First of all the implementing organisation needs to assess the scalability of the innovation and ensure that it matches the needs and constraints of target groups. Subsequently, the challenge of **generating a demand** for these appropriate solutions and **strengthening the offer** will need to be faced. To do so, **financial and human resources need to be mobilized,** an **enabling political, legal and institutional environment** fostered and partnerships and networks set up. Last but not least, involved organizations will face the challenge to set up a comprehensive monitoring and evaluation system in order to assess the efficiency and relevance of the implementation and to adjust the strategy as scaling-up proceeds.

2 / A guide to design a scaling up strategy for sustainable building and energy projects

After an in-depth review of the existing literature, it has been observed that very few publications are dealing with scaling-up sustainable buildings and energy projects. No documentation provides decision makers and practitioners with practical guidance to set up scaling-up strategies for such projects. Thus, the Sustainable Architecture & Energy Scaling-up project (SAESUp: www.saesup.org) has been initiated in order **to capitalize on, consolidate and share knowledge and know-how from initiatives and experiences carried out by stakeholders in charge of renewable energy and energy efficient buildings programmes** in Asia. The present guide is the main deliverable of this project.

It is **based on both literature review and lessons learnt from six successful projects** *(cf. §5 of the Introduction)*. Based on a detailed analysis of these projects, **it intends to modestly contribute to an essential reflection regarding scaling-up of sustainable buildings and energy programmes** by developing a set of good practices, recommendations and guidelines for future scaling up initiatives with a special focus on the design of the strategy.

> The present manual is about how to design a Scaling-Up Strategy for Sustainable Energy and Buildings projects

3 / Who should use this guide

This guide is mainly intended for **project developers and managers, technical assistance providers, decisions makers and donors** who face the challenge of scaling-up sustainable energy and building innovations.

Recommendations put forward in the present manual mostly derive from experiences and practical lessons learned from projects focusing on private rural households mainly in rural area in cold Asian regions. Hence, some recommendations may be more relevant to similar locations or types of projects. However, **the methodological framework and most of the issues addressed below are more broadly applicable to most sustainable buildings and energy projects all over the world.**

> It is essential to point out that "ready-to-use" or "widely-applicable" recipes for scaling-up do not exist. This present manual only provides readers with ingredients to design their OWN and UNIQUE scaling-up strategy based on the innovation's intrinsic characteristics as well as on local context specificities and target groups' needs.

4 / Definitions of terms

Scaling-up is interpreted here as a deliberate effort to increase the impact and coverage of an innovation tested in pilot projects so as to benefit more people, more equitably and in a longer perspective. In the existing literature on scaling-up, numerous typologies have been developed *(cf. Box 1)* to describe the different approaches and strategic choices that a programme can make to scale up an innovation. **Most factors that can impact a scaling-up process are detailed in this manual,** so as to provide readers with a large range of tools and key questions to elaborate their own scaling-up strategies.

Typologies of scaling-up

Box 01

Type	Description	Alternative terms
Quantitative scaling-up	'Growth' or 'expansion' in their basic meaning; increase the number of people involved through replications of activities, interventions and experiences	Dissemination, replication, scaling-out or horizontal scaling-up
Functional scaling-up	Projects and programmes expand the types of activities *(e.g. from agricultural intervention to health, credit, training, etc.)*	Vertical scaling-up
Political scaling-up	Projects/programmes move beyond service delivery and towards change in structural/institutional changes	Vertical scaling-up, institutionalization
Organiza-tional scaling-up	Organizations improve their efficiency and effectiveness to allow for growth and sustainability of interventions, achieved through increased financial resources, staff training, networking, etc	Vertical scaling-up, institutional development

Model and Innovation are used here in their broad sense and indifferently to designate "what is to be scaled up". They generally designate new techniques or technologies *(e.g. biogas plant, straw-bale house, etc.)* or products *(e.g. solar home system)*. However, it may also be a new process, a new approach or methodology to deliver a service/product or an innovative financing mechanism.

Pilot project refers to the initial project that demonstrates the viability of the innovation by developing, implementing and testing it at a small scale in order to assess its efficiency and relevance. The development of the scaling–up strategy will be mostly based on the experiences and lessons learnt from one or numerous such preliminary project(s).

Originating organisation is the organisation implementing the pilot project.

Adopting organisation is the organisation that will adopt the innovation and bring it to a larger scale. In some cases, originating and adopting organisations can be the same. *(cf. Step 1-4)*

5 / The 6 case studies analysed by the project

The selection of the 6 projects studied to produce the present guide draws from two criteria. Firstly, a special focus has been made on **sustainable buildings projects in rural area** mainly for two reasons: buildings or housing projects are generally more difficult to scale-up compared to renewable energy ones and working in rural area is generally more challenging than in urban or semi-urban areas. Besides, it has been decided to focus on mountain areas to ensure a certain coherence between the different case studies. Secondly, case studies have been selected based on the **maturity of the innovation** as well as on their **potential of being brought to a significant scale.** All projects are at least in the second phase of development and project stakeholders have carefully worked on their strategy to mainstream the innovation. However, some projects are much more advanced than other (in terms of scale) offering a contrasted analysis.[2]

Box 02

Passive solar Housing (GERES – India)

The "Passive Solar Housing" project's specific objective is to improve livelihoods of rural populations living in remote areas by addressing unhealthy indoor winter conditions, alleviating energy vulnerability and enabling the development of income generation in the newly improved habitat. The project aims at improving the rural population livelihoods by integrating energy efficiency technologies in 1,000 rural houses and community buildings in 100 villages in North-Eastern India (Leh and Kargil District and Lahaul&Spiti). Local masons and carpenter are trained in order to supervise the construction and to ensure the quality. Stakeholders are organised in network to promote and disseminate energy efficiency initiatives.

Main achievements and lessons learnt regarding to scaling-up mechanisms :

1. The **demand** has been generated by: (1) **demonstration through "influent people"** and site visit, (2) **design according to regional and cultural trends** and (3) **awareness raising campaign** (TV, Radio).
2. **Capacity building of masons and carpenters** as service providers is essential to (1) **supply the generated demand,** (2) **convince people** that want to build house and (3) **ensure construction quality.**
3. It is **easier to generate demand for solar gain techniques** (visible and fashionable) than insulation techniques.
4. **Public buildings are a good entry point** to initiate collaboration with government and then mainstreaming energy efficiency in domestic housing.
5. Achieving the twofold goal of (1) **focusing on poor and remote families** and (2) **implementing condition for sustainable scaling-up** is challenging.
6. **Subsidy is required for demonstration but limit replication** as villagers expect subsidy and may not take own initiative

Biogas Support Programme (Nepal)

The Biogas Support Programme (BSP) in Nepal managed the installation of over 200,000 domestic biogas plants between 1992 and 2009. The plants use cattle manure to provide biogas for cooking and lighting as well as slurry used as organic fertilizer. The history of biogas in Nepal is quite ancient, but the first phase of the BSP project started in 1992 only. It is currently the end of the fourth phase, whose main objective is to further develop and disseminate biogas plants as a mainstreamed renewable energy solution in rural Nepal, while better addressing poverty, gender and social inclusion and regional balance issues. At the same time, it aims for ensuring enhanced commercialisation and sustainability of the sector.

Main achievements and lessons learnt regarding to scaling-up mechanisms :

1. A **supportive government policy** (subsidies, loans, fiscal and legal policies)
2. The **supportive long term donors' commitment**
3. The setting-up of **an efficient Public-Private Partnership** has been essential:
    a. Public sector has to facilitate and coordinate the sector
    b. Private sector is responsible for implementation and after-sales services.
4. The **quality of the products** guarantees owners' satisfaction.
5. The organization of the biogas companies in an association to **regulate the sector, prevent bad practices and strengthen their capacities.**
6. Provision of **subsidies** for making biogas systems affordable with additional subsidies for remote areas as well as for poor and less favoured households.
7. Setting up of a **Biogas Credit Fund by AEPC to provide loans with low interest rates through local cooperatives and other MFIs.**
8. Good **monitoring and quality control mechanisms.**

CESEF project (SKAT – Nepal)

CESEF (Cost Effective, Social and Environmentally Friendly Building Materials and Construction Techniques) has been introduced in Nepal together with Vertical Shaft Brick Kiln (VSBK) Program Nepal by SKAT in 2005. The project promotes building material and techniques which are cost effective or affordable to all, socially friendly with associated job creation, and environmentally friendly mainly through energy savings. The project's objectives are to improve existing building material and practices on the three key indicators (Environment, Job Creation and Affordability) as well as to introduce new, regionally proven, construction materials and techniques. To scale up these techniques, the project is developing several activities such as: building capacities, best practices workshops, involvement of local stakeholders, etc.

Main achievements and lessons learnt regarding to scaling-up mechanisms :

1. Inclusion of the RTB in the **National Skill Testing Board occupational profile** for the masons & petty contractors.
2. Demonstration of CESEF Technologies **from renowned and highly social buildings** such as Hospitals, School, community& "clients/partners" buildings.
3. **Disseminating Technologies packages** only after fine-tuning **according to local needs and environment** with close cooperation with stakeholders and respective experts.
4. **Organizing national and International workshop to create platform** to share and learn from each other. Best practices developed during the workshop are documented and published.
5. **Trainings especially focused to the masons and petty contractors** involved in informal construction sector.
6. **Formation of Change Agent** (a group of Masons, Petty contractors, Producers, labours) as marketing and selling CESEF packages.

Straw-Bale Buildings (ADRA - China)

Since 1998 ADRA China has introduced straw-bale (SB) construction technology into China. Over 700 buildings were successfully constructed, cutting heating fuel consumption by nearly 70% while substantially improving indoor temperature and living conditions. Over the years ADRA China has received numerous requests to conduct technical training for straw-bale construction. In 2008, the Heilongjiang Province, who approved a US$250,000 plan to subsidize energy efficient rural housing including straw-bale houses, has signed a 2 years contract with ADRA to provide technical training mainly to government construction bureaus. In addition, based on their experience in northern China, ADRA is starting a replication program to develop straw-bale houses in the Sichuan areas devastated by the 2008 earthquake.

Main achievements and lessons learnt regarding to scaling-up mechanisms :

1. Although the combination of bricks and bales is not the most energy-efficient design (because of thermal bridges), the inclusion of bricks was necessary to make **the whole system culturally acceptable.**
2. **Importance to give adequate time to the early phases** of research, training, and project design, project planning, securing matching fund, etc.
3. Housing project involves lots of logistics, it is important for the management team **not to loose sight of the ultimate goal of a housing project** *(e.g. technology transfer, not just the construction of SB houses).*
4. To generate the demand, **personal tours to SB houses (exposure visits) and villager-to-villager approaches worked best in NE China.**
5. When local context is favourable, **the inclusion of the local authorities,** in this case through the Project Management Office (PMO), is a really efficient way to promote techniques while guaranteeing the quality of the construction and create the basis for the replication post-project.

Straw-Bale Buildings (UNDP - Mongolia)

In 1995 the first Straw Bale Buildings (SBBs) were built in Mongolia in order to improve the thermal insulation of buildings with low cost, ecological and locally available materials. Since 1997, UNDP of Mongolia has been participating trough various programs to the development of SBBs. In 2002, UNDP launched the "Commercialization of Super-Insulated Buildings in Mongolia" project which goal was large-scale replication of highly insulated SBBs in Mongolia. Principal components of this project were: technical support, training, awareness raising and demonstration super-insulated SBBs.

In order to mainstream Energy Efficiency (EE) in Mongolia, a third project (BEEP) integrates the following components: (1) Revision of Mongolian Building Construction Norms and Standards, (2) Demonstration of new and improved EE techniques, (3) Training and Awareness Program and (4) Facilitating access to EE financing.

Main achievements and lessons learnt regarding to scaling-up mechanisms :

1. **Demonstration buildings** are far more effective when they are in the same sector and use the same modalities as are expected for replications.
2. **Project design should be sufficiently flexible and the project team needs to dispose of enough time and modesty** to adapt the project to the context and demand evolution.
3. Involve as much **as possible all the stakeholders (incl. beneficiaries) during the project design** to take in account social and cultural aspects.
4. **Fully funded projects could be counterproductive** regarding beneficiaries' involvement, as well as for the large-scale diffusion of the model.
5. Special attention has to be paid regarding to **how demand and offer could be linked/connected in a sustainable way.**
6. **Integrate in the project design specific financial and human resources for project post-evaluations,** in order to monitor and evaluate it real impacts and to better understand the innovation diffusion mechanisms.
7. All professional staff should **have periodic work plans with clear goals, priorities, and timetables and regular internal reporting.**

Energy efficiency in the building sector (FFEM-ADEME – China)

This program launched in 1999, in the Heilongjiang province (HLJ), focus on new building construction (social housing in urban context and small rural private houses) as well as on the retrofitting of 70's and 80's buildings, with the objective to reduce drastically the emissions of greenhouse effect gases.
The first phase of the project (1999-2004) has demonstrated that reducing energy consumption by 50% through insulation and improved heating controls is possible. In cold regions such performances were reached with acceptable additional cost. The second phase of the program focuses on the pre-diffusion of energy efficient buildings in China. The present study and manual only focus on the rural component of the project.

Main achievements and lessons learnt regarding to scaling-up mechanisms :

1. HLJ government have **ambitious objectives to improve the housing condition** by fostering the refurbishment of rural dwellings.
2. HLJ government offers a subsidy of 5,000 RMB for the construction of a new house that respect the standards of energy efficiency.
3. A very "fashionable" design for the energy efficient house can lead to spontaneous replication. However, special attention must be paid to **prevent the construction of similar but not energy efficient houses "counter-references".**
4. Provide decision makers, architect and professional with a catalogue of energy efficient house design plans may support the mainstreaming of these houses.
5. **The HLJ province is providing some funds for Research & Development activities regarding energy efficiency.**

/ Issues attributed to the specificities of the building/housing sector

Compared to renewable energies solutions, the scaling up of sustainable buildings projects can be more challenging, in particular due to the large investment that housing represents in people's lifetime. Hereafter are detailed some of the main elements that should be taken into account for any scaling-up strategy in the building sector and may explain why a promoted technology or technique that has proven to be very efficient, cost-effective and of good quality, has not been socially or politically accepted.

Investment and feeling of safety

A house is usually the largest and most important purchase a family ever makes. A good quality house is the foundation for the physical, psychological *(e.g. feelings of "safety" and "comfort")*, and financial wellbeing of a family. It is very difficult to persuade a family to risk their future wellbeing on an unknown and unproven (to them) construction technique. For example, it is easily understandable that a family with 2 or 3 children will never take the risk to buy a straw-bale house if they do not trust the quality and performances of such a building or if they think that the probability of fire is quite high.

Lifetime

While improved stoves or renewable energy systems lifetime spans from 3 to 30 years, a house is a very long-term investment that most families made only once or twice in their life. The lifetime of a building is generally superior to 50 years. Thus, the commitment of a family regarding the house is considerably more important compared to any energy system.

Social criteria

In many countries, the house is one of the most important indicators of the social success. Provided that people have some money to invest, they will try to make architectural choices and select materials in order to ensure that their building matches local preferences. For example in China, farmers' houses are generally made of straw and mud, but people strive to build a brick house as soon as they have sufficient savings.

Prejudice

The building sector is suffering from numerous prejudices that need to be addressed while promoting innovation. For example, people assume straw-bale buildings are not sturdy enough despite numerous studies demonstrating that straw-bale house are more resistant to earthquakes compared to the standard fired-brick houses and more resistant to fire than a house with thin masonry walls.[3]

Resistance to change and vested interest

Numerous contractors and construction companies have an interest in blocking the development of innovative models since they have vested interests in maintaining the status quo. Innovative models will also need to overcome corruption. This is particularly true with the utilization of natural materials that are locally available since it drastically reduces the profit margin of the construction companies. Last but not least, the construction sector is one of the main pillars for local employment and growth. The important economical interests in this sector explain its inertia and significant resistance to change.

/ Methodological inputs and structure of the document: Four steps to a successful scaling-up project

Scaling-up is a form of systemic change that involves simultaneously acting on all the levers that may contribute to replicate or mainstream the innovation. To start with a challenge of this size, it helps to break it down into manageable pieces or tasks.

For this purpose, the present manual has been structured along four steps [4]

STEP 1   **Preliminary work:** assessing the scalability, understanding the elements of context and creating a shared vision.

STEP 2   **Design of the scaling up strategy** by addressing the six levers of action that are the pillars of a successful scaling-up project.

STEP 3   **Implement the Scaling-up strategy:** a comprehensive logistic management system and monitoring are essential to guarantee the efficiency of the project and to adapt the strategy to local context and environment evolutions.

STEP 4   **Design and implement the Exit Strategy:** withdrawing progressively from the project while making sure that the model left behind will thrive.

This manual mainly focuses on the steps 1 and 2 in order to support project developers and decision makers in designing their own scaling-up strategy. The four steps and the conceptual framework of analysis of the scaling-up process is portayed on figure next page.

The four steps to design
a succesful scaling-up strategy

STEP 1 / Preliminary work: understand the elements of context, assess scalability and create a shared vision

STEP 2 / Design the scaling up strategy

Pilote Innovation
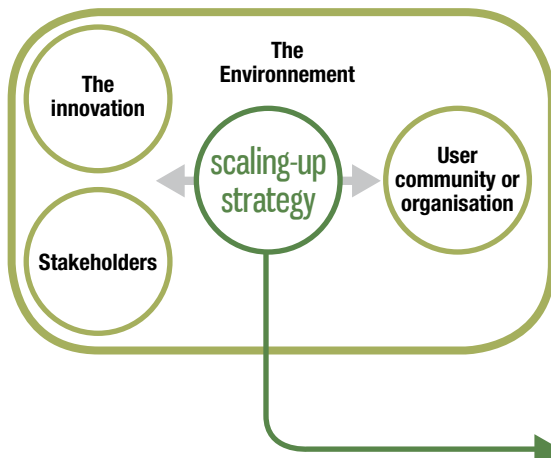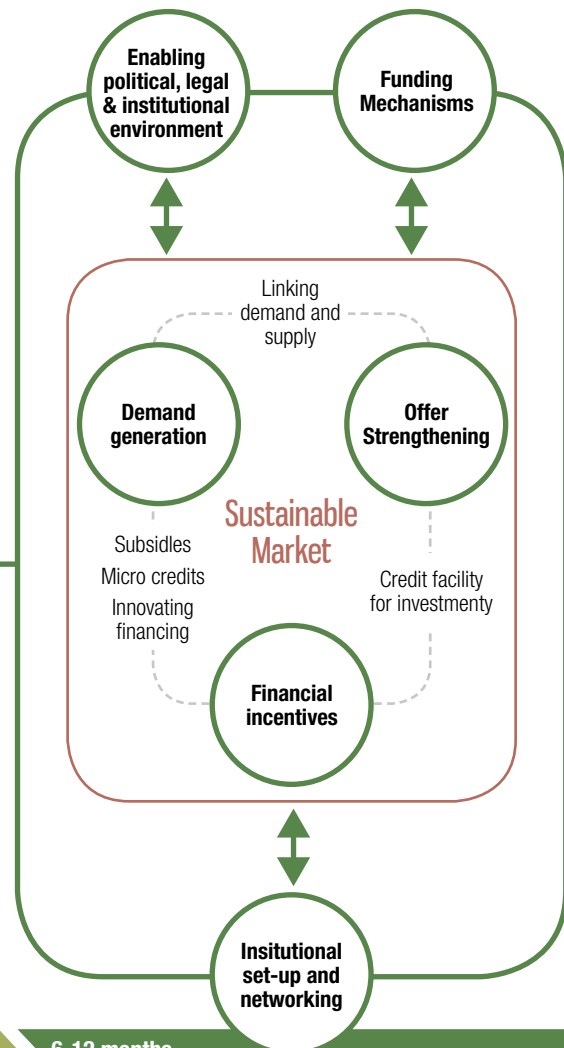
4-12 months

6-12 months

Scaling-up is portrayed as an open system of three elements (Innovation, Stakeholders & Users) that interact one another in a given Environment. **Preliminary work consists in understanding these elements of context as well as assessing the innovation scalability and creating a shared vision between all the stakeholders.**

An open-system perspective means that the task of scaling-up is not exclusively a technical and managerial undertaking, unaffected by the outside world. It is heavily influenced by environmental factors, such as the political and cultural context and changes, climatic and geographic considerations, social capitals and capabilities as well as the institutional capacities of the local and national governments, to name but a few.

Once the elements of context have been clearly identified and the scalability of the model assessed, it is time to define the scaling up strategy. To do so, strategic choices have to be made. In the present manual those strategic choices are described as the six levers (green circles) that have to be activated to achieve the successful scaling up of the model: **(1) creation of an enabling institutional and political context, (2) demand generation, (3) offer strengthening, (4)financial incentives, (5) funding mechanisms** and **(6) institutional set-up and networking.**

It is also important to study **transversal interactions between these levers.** These interactions are represented by the grey dotted lines.

For example, one important interaction to be studied is how offer and demand could be linked together with innovating financing schemes in order to create a sustainable market (red oval).

STEP 3 / Implement
the scaling-up strategy

STEP 4 / Exit strategy

Monitoring
& evaluation

Logistics
managment sytem

EXIT

5-15 years

1-3 years

Scaled-Up
Innovation
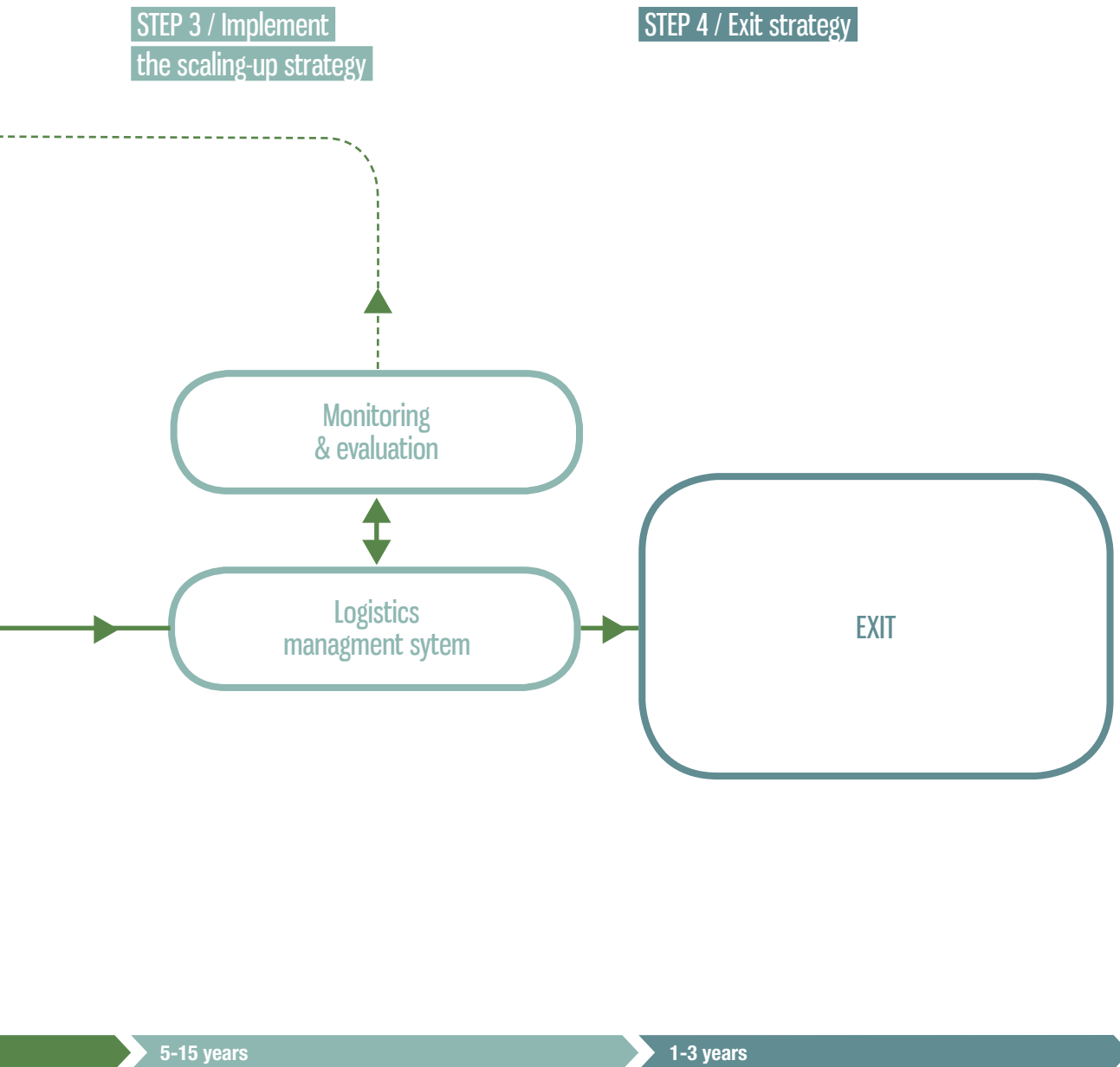
Scaling-up is a form systemic change implying to implement thousands of training, awareness raising, promotion and quality monitoring activities. Thus, it is essential to develop a strict **logistics management system.**

In addition, it is primordial to define a comprehensive **Monitoring and Evaluation (M&E)** system so as to assess the efficiency of the actions and adjust the strategy as scaling-up proceeds to take into account the evolution of both environment and innovation.

The M&E system can be consider as the seventh lever of the scaling-up strategy.

Once the scaling up project has been implemented for several years, **the model should have reached a significant scale and may be able to keep developing sustainably.**

But the project should not stop suddenly. Rather, the implementing organisation should focus on smoothly withdrawing both its technical and financial supports so as to strengthen a sustainable and autonomous market for the model: **this is the objective of the exit strategy.**

/ Preliminary remarks

Availability of human and financial resources to design the Scaling-Up Strategy

Working on the definition of a scaling-up strategy can be a long and time-consuming process. This is especially true when it implies to transfer knowledge and knowhow from the originating to the adopting organisation. Without specific funds available for this initial stage, work will be done on voluntary basis or with the remaining budget of the originating organization. This may have significant consequence on the quality and relevance of the project design and will be paid for later. In addition, the originating organization is expected to define the scaling-up strategy while pursuing its initial activities, which can lead to a lack of human resources.

Thus it is primordial for donors and decision makers to develop specific funds to support the draw-up of scaling-up strategies involving both originating and adopting organizations, as well as project stakeholders.

Create a shared vision

Before starting any scaling-up process, it is primordial to create a **VISION** that should understandably be shared by all key stakeholders and when possible achieved by a participatory process. To do so it is strongly advised to carry out an in-depth reflection regarding **what the project aims at doing and how it will be achieved:**

- **WHAT is being scaled up:** Clarify the model to be scaled up;
- **WHO will lead the scaling-up process:** Determine organizational roles and the institutional set-up;
- **WHERE scaling-up will occur:** Establish the expected scope of the scaling-up effort and the dimension(s) along which scaling-up will occur;
- **HOW scaling-up will be achieved:** Identify the methods of going to scale. [5]

The documentation of this shared vision is essential to communicate on the model during the expansion process when more and more people are associated to the project or seek to replicate the innovation. Without documentation, there is a risk that becomes a confused process where the essential components of the innovation and its contributions are not well understood by involved stakeholders.

Participatory approach for successful scaling-up

While designing the scaling-up strategy, it is strongly advised to **go through a participatory approach through which all project stakeholders are actively involved during the preliminary work and the design of the strategy.** It is also advised to associate some organisations only indirectly concerned by the project but whose participation can be beneficial from a comprehensive point of view.

When possible, participatory process will also include user groups' representatives to tailor the innovation to the local context and needs of target groups thereby favouring its appropriation.

The **participatory approach should be extended to the whole project's duration** by involving users and stakeholders as much as possible in the project decisions *(e.g. participatory workshops, Monitoring & Evaluation cells, etc.)* **so as to foster their participation and constantly adjust the model and strategy** to the evolutions of the context and the environment.

Practical tools to which the reader can refer are indicated by the icon on the left. [6]

5. To go further - *Scaling-up—From Vision to Large-scale Change,* R. Kohl and L. Cooley, MSI - 2004

6. All related practical tools and full version of the cases studies are available in the attached CD or can be download en SAESUP website: www.saesup.org

Preliminary work: assessing model's scalability and local specificities, defining target groups and key stakeholders.

Before starting to work on the design of a scaling-up strategy, it is essential to assess if an innovation is mature enough and adequate to the local context and environment to be scaled-up.

This first step is essential to clearly understand and take into account the elements related to the characteristics of both the innovation and of the local environment. Target groups and resource team may also be carefully considered. It is important to resist any urge to skip this first step and start directly to work on the scaling-up strategy.

The main objective of this chapter is to support the reader in this preliminary work by:

- Assessing the maturity and scalability of the innovation
- Understanding the elements of context and how they can impact the scaling up project
- Identifying the needs and expectations of end users and target groups
- Determining the role and competencies of implementing organisations

1 / The innovation

The innovation refers to the new practice or model that is being scaled up. It is not necessarily a technical innovation but it may also be a new process, a new approach in organizing a service delivery or an innovative financing mechanism [7].

Key questions

1. Does the innovation respect the "CORRECT" attributes (e.g. Credible, Observable, Relevant, Relative advantage, Easy to understand and implement, Compatible and Testable)?
2. What is the degree of change in current practices and behaviour implied by the adoption of the innovation?
3. Is the innovation tailored to the local cultural and social context?
4. How both stakeholders and "user organisations" could be associated to the design of the innovation with a participatory approach?
5. Are required raw material available in sufficient quantity to reach the objective of scale?
6. Does the innovation imply negative impacts on the environment or introduce competition in use?

Assess Innovation Scalability and Maturity

It may happen that an innovation is assumed to be successful and ready to be scaled up based on insufficient objective evidence and without a thorough evaluation of the actual scalability of the innovation. Before starting to scale-up the innovation, it is essential **to assess the model's strengths and weaknesses, evaluate its cost-effectiveness and compare it with alternative models for achieving the same goal. The "*CORRECT*" attributes** *detailed in the Box 3 resume* the main questions that have to be answered at this stage.

This approach has to be completed by an **assessment of the innovation** maturity based on technical, social, economical and political criteria that are directly related to the innovation intrinsic characteristics and local context. If the scalability and maturity of the innovation are not evident, it is essential to resist the pressure to scale-up the innovation before its effectiveness and feasibility have been fully established. Ideally, this task should be carried out by people that are external and independent from the adopting organization, the latter being perhaps inclined to promote the model it has been working on for many years.

Assess the CORRECT Attributes to determine the model scalability and maturity

Box 03

Documentation based on international experience concludes that models satisfying the "CORRECT" attributes are most likely to be successfully scaled up:

- **Credible** in that they are based on sound evidence and/or advocated by respected persons or institutions
- **Observable** to ensure that potential users can see the results in practice
- **Relevant** for addressing persistent or sharply felt problems
- **Relative advantage** over existing practices [positive cost-benefit, including implementation costs]
- **Easy to understand and implement** rather than complex and complicated
- **Compatible** with the potential users' established values, norms and practices
- **Testable** without committing a potential user to complete adoption when results have not yet been seen.

TOOL 1
provides the reader with key questions regarding CORRECT attributes and proposes some criteria to assess the model maturity.

7. In the present document, the words "innovation" and "model" are used interchangeably and used to refer to the product, technique or mechanism that is scaled up.

Assess the Degree of Change Implied by the Model and Tailor the innovation to the context

. . . .

The more the degree of change implied by the model is large, the more resources and efforts are needed to scale up the innovation. When an innovation implies modifications in everyday life or practices *(e.g. switching from wood to gas for cooking, changes in building construction practices)* or do not match with local social and cultural specificities, it may significantly impact its social acceptance. It is therefore essential to tailor an innovation as much as possible to the local context by taking into account social and cultural issues, so as to foster its replication. This has to be done by involving the targets groups as explained in the next chapter. In some cases, guaranteeing replication may necessitate to reduce the intrinsic efficiency of the model *(Cf. Box 4)*.

Adaptation of innovation to match with the social and cultural context

Box 04

Passive Solar Housing (Ladakh, GERES)	Straw-Bale Buildings (China, ADRA)
GERES is promoting the development of passive solar houses in Northern India. Promoted techniques include the insulation of the house. To do so, a second wall (jacket wall) must be built that is distant from the load-bearing wall of a few centimetres. The gap between the two walls is filled with straw as insulation material. In Europe, the thickness of the insulation material (here straw) is calculated by the value of the coefficient of thermal transmission U. In Ladakh, the GERES decided not to focus only on the U value, but to determine the thickness of straw according to the maximum value "socially" acceptable by local people, even if this thickness does not enable to reach the optimal thermal performances.	China has a long history of using straw in construction, but building with straw has been considered a sign of poverty and backwardness in modern times. A brick house is a symbol of wealth and success. Thus, to convince house-owners of the straw-bale buildings (SBBs) strength and durability, brick columns have been included in the design rather than using a wood-frame, despite the significant thermal bridges generated. In addition, aesthetic aspects have been taken into account by encouraging families to adapt the design of the houses in order to match with their esthetical preferences.

Availability of the raw material and local resources

. . . .

Tailoring the innovation to the local context also implies to take into consideration local resources. Working with locally available resources (material, financial and human) decreases the cost and complexity of an innovation *(e.g. straw is an efficient, cheap and locally available insulation material)* while limiting the dependency of end-users toward external resources. In spite if this advantage, the availability of these materials in sufficient quantities to reach the desired replication scale, needs to be carefully assessed to ensure that the scaling-up will not be impacted by the lack of raw material. In addition, when the innovation is using natural resources, bringing it to scale can have environmental impacts *(e.g. deforestation, water consumption, intensive agriculture etc.)* as well as introduce competition in uses *(e.g. straw-bale is also used for feeding animals).* All these potential impacts have to be carefully assessed before scaling-up an innovation.

Advantages of the innovation: be aware of the difference of perception between donors, stakeholders and users

. . . .

While developing and/or promoting an innovation, **it is important to keep in mind that the perception of the advantages may significantly differ from the donors point of view compared to users' perceptions.** For example, the main benefits perceived by the families that installed a biogas plant (BSP – Nepal) are time and money savings to purchase the fuel (firewood, dung, coal or gas) as well as the improvement of indoor air quality. The production of the slurry as organic compost is a decisive argument only for a small share of the beneficiaries. Environmental benefits that generally are one of the major advantages from donors' point of view -especially for CDM (Clean Development Mechanism) funded projects - are not perceived at all by end-users.

Step 1

Preliminary work: assessing model's
scalability and local specificities, defining
target groups and key stakeholders

2 / Target groups
and end-users

Project target groups and end-users refer to individuals,
groups or organizations gathering or representing people
that are expected to implement and adopt the innovation.

🔑 Key questions

1. Who are the target groups and end-users focused by the programme?
2. Are they the most relevant to support the innovation scaling-up or other target groups might
    be more appropriated? Could the benefits of the project be extended to other target groups?
3. Do the target groups perceive a need for the promoted model?
4. What are the socio-economic characteristics of the target groups?
5. What are the perception and potential influence of the target groups on other people?

It is essential to distinguish the end users from the target groups. Most projects involve several target groups to whom certain project activities will be addressed *(e.g. masons, carpenters, the ministry of education that will use solar passive design for their school, etc.)*. However, there is generally only one or few different end-user groups *(e.g. the poor farmer of a region, rural schools, etc.)*.

Start by clarifying who are the end-users
and to what extent they have the capacity to carry-out
large-scale implementation of the innovation

Identifying end-user groups is never obvious and must be done carefully. It is not unusual to see projects where end-users have been selected without in-depth considerations and reflection into the capability, at least initially, of the end-users to enhance the diffusion of the innovation to a large scale.

This is particularly true for projects aiming at scaling up a product or service destined to people in a precarious situation. It generally leads to the stigmatization of both the innovation and user groups since the innovation may be labelled as "a product for the poor", which is often interpreted as a "poor product" that nobody wants to buy, and certainly not poor people themselves. Middle-class people, professionals, and decision makers lose interest in the innovation. This may seriously jeopardize the opportunity to scale-up the model.

In addition, the high level of subsidies needed to reach poor people may prevent the development of a sustainable and market-based sector. The question of compatibility between the development of an innovation targeted to people in a precarious situation and a scaling-up approach is recurrent and could be resumed as follow: **Is it feasible, pertinent and effective to combine two approaches: on one side to set up the essential conditions for sustainable replication and on the other side an approach to reach the poor?**

Many actors conclude that the model needs to be first scaled up by focusing on middle and well-off classes. Once the critical mass has been reached, supply chains organised, costs cut down thanks to economies of scale and the enabling environment created, it will be much easier and efficient to focus on less wealthy end-users.

From a more general point of view, experience demonstrates that **it is sometimes relevant to start with an "intermediary end-users group"** in order to first create the enabling environment and a critical mass before extending the model to the end-user group initially focused on in the project. There is obviously not one answer to this complex question and it is primordial to discuss this issue with project's stakeholders during the design of the strategy.

Importance of the end-user identification

Box 05

Energy Efficient Housing (EEH) project (UNDP – Mongolia)

The EEH project's original goal was to mainstream unsubsidized super-insulated straw-bale buildings (SBBs). In the original project design, this was to be achieved through the provision of technical support, training, awareness raising and full funding of demonstration SB social service buildings (schools, health clinics, etc). From the EEH project's inception, the SBB social service and institutional buildings goal has been expanded to also promote other types of building super-insulation, with a majority of the funding coming from beneficiary households, and demonstrate super-insulation directly in private houses. This **change in the project's target group was a major improvement in producing project results that were more likely to be applicable and replicated post-project.**

Additionally, interviewed stakeholders mentioned the emergence - after the end of the EEH project - of a "third target group": breeders, who are looking for cheap and good insulated buildings for the stockbreeding of pigs and chicken. This potential user group has spontaneously contacted the programme in order to obtain more information regarding SBBs and seems to be a promising target group for the diffusion of SBB. This example perfectly illustrates that the **end-users group identification is never obvious** and that an "intermediary end-users group" (in EHH case it would have been pigs and chicken breeders) **could be necessary to first demonstrate and scale-up the innovation,** before extending the programme to the initial target group (here private houses and social services buildings).

Identifying the other target groups

End-users are not the only target group that has to be considered while preparing a scaling-up strategy. **All the stakeholders that will contribute to the scaling-up of the innovation have to be clearly identified,** since they will have to be convinced of the relevance of the innovation and several activities will be focused on these target groups mainly in order to strengthen their capacities *(e.g. masons, carpenters, the ministry of education that will use solar passive design for their school, etc.) (cf. Mapping of actors in STEP 1 - § 4)*

Taking users needs and realities of the into consideration by involving them in a participatory process

As previously pointed out, the needs of end-users and target groups as well as their cultural and social realities have to be taken into account in order to tailor the innovation to them. Thus, it is **essential to involve as much as possible users groups**– in addition to the resource teams and project stakeholders –**in the design of both the innovation and the scaling up strategy with a participatory approach.** When stakeholders are involved in the project's design from the beginning, they are familiar with both its aims and established practices. They are thus likely to propose an innovation that addresses users' needs and realities and that they are willing to implement. The involvement of well-respected individuals from user organizations helps to build a convincing case for the innovation, especially when these persons then go on promoting it to sceptics. Participatory approaches foster ownership. **Those who perceive they own the innovation are more likely to see it as advantageous and to support its scaling-up than those who had little input into its design** [8].

8. *"Practical guidance for scaling-up health service innovations"* – WHO, ExpandNet, 2009
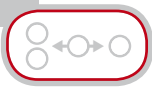
3 / Environment

The environment refers to conditions and institutions
that are external to the resource team and user organisations
but that fundamentally affect the prospects for scaling-up.

Step 1

Preliminary work: assessing model's
scalability and local specificities, defining
target groups and key stakeholders

🔑 Key questions

1. Is there any singularity in the pilot project environment *(e.g. cultural, ethnic or religious values; distribution of power; economic conditions)* that is essential for the mainstreaming of the innovation?

2. Will these elements of context be present in the scope defined for the scaling-up strategy?

3. What are the evolution trends of these environmental factors, what can be foreseen in the coming years? How can these trends be anticipated?

4. Which evolutions could represent new opportunities? And which ones may terminate existing opportunities, create new threats or barriers to overcome?

5. How could an efficient monitoring and follow-up system be set up in order to track the evolution of these environmental factors?

Projects and organisations are located within a broader social, cultural, economical and political context that can exercise substantial impacts on the scaling-up process. For this reason, it is essential **to identify contextual factors that may have been essential to the success of the model.** This analysis can be particularly important, as these elements are often invisible to those who live it every day and therefore have no other points of comparison.

Identify the various environmental factors influencing scaling-up

It is essential to understand both the current **socio-economic and cultural characteristics and trends in order to use them as levers in the scaling-up strategy, rather than trying to oppose them.** However, there are many other environmental, social, political and economic factors that may influence the scaling-up process and that sometimes interact and overlap. Some of the main factors are detailed below.

Natural environment

The natural environment *(e.g. climate, topography, natural resources, soil fertility, etc.)* has obvious impacts on the potential to scale-up a renewable energy and energy efficient buildings projects (e.g. it will be easier to promote wall insulation in a region where winter is very harsh and micro-hydro power in a mountain area). Even if the evolution of these factors is quite slow, it is important to monitor and anticipate potential evolutions *(e.g. climate changes impact on agricultural projects)* in order to adapt the scaling-up strategy. In addition, local and national policies, can significantly affect the availability of natural resources as illustrated in the Box 6.

Impact of national policy on the availability of natural resources

Box 06

Straw-bale buildings (Mongolia, UNDP)

The Energy-Efficient Housing (EEH) project's objective was to mainstream super-insulated Straw-Bale Buildings (SBBs) in Mongolia. A study ordered by the UNDP within this project estimates that over 1,200 straw-bale houses could be built annually with the available straw within close vicinity to Ulaanbaatar where the majority of house construction is occurring in the country. But when defining a scaling-up strategy, **it is primordial to analyze what are the current trends of the agriculture sector.** The analysis carried out in Mongolia concludes that *"approximately 37% of required wheat was produced domestically as of 2007. Within the last two years, following the Government's Crop-3 campaign for 2008-2010 the production has significantly increased. In 2008, 50% of required wheat was produced domestically, and in 2009, it is expected that wheat production will reach 78%."* The conclusion of the analysis allows great optimism for the opportunity to scale-up SBBs in Mongolia, since straw will be widely available. Conversely, if the trends of wheat production would have been negative, the relevance to scale-up SBBs should have been questioned.

Demographic trends

As far as housing projects are concerned, it is obviously easier to scale up an innovation when the demographic trend is positive since more buildings will be constructed or retrofitted. The social and cultural context regarding familial living trends is another factor that may affect the scaling-up strategy as illustrated in the Box 7. In addition, the promotion of energy-efficient housing in rural area also touches on a non-energy related issue and may also be regarded as strategic choice to slow down or to stop rural exodus [9].

Impact of the cultural context and demographic trends

Box 07

Passive Solar Housing (India, GERES)

In Kargil district (western Ladakh) families are mainly multi-generation *(i.e. 3 generations in the same house)* thus scaling up strategy will need to focus more on retrofitting. By opposition in Changtang (Eastern Ladakh) families tend to be more nuclear leading to the construction of new small houses for 3-4 people. Thus, the scaling-up strategy needs to focus more on new houses.

Political context

The extent to which the innovation is in line with local and national decisions makers affects the time, efforts and resources needed to scale up an innovation. Impacts of the political context on an innovation are numerous *(e.g. subsidies, interest free loans, land and fiscal policies, regulation, etc.).* Typically **elections or other changes in leadership may open or close windows of opportunities.**

International context and donor support

International trends, eventually originating from global summits and resulting resolutions, influence the issues prioritized by national policies and thereby affecting scaling-up. Similarly, the priorities of major donors will have direct consequences on scaling-up strategy. Kyoto protocol and the related Clean Development Mechanisms as well as the Voluntary Reduction Emissions market that has grown in parallel, are major examples of factors evolving at the international scale. Renewable energy and energy-efficiency projects are indeed currently benefiting from a positive international recognition.

Anticipate changes

As scaling-up is a long-term process (that generally takes over 10 years), the project environment is perpetually evolving as the scaling-up proceeds. Thus, **determining how the environment affects scaling-up is not a one-time exercise** and understanding its evolution is necessary to anticipate and identify changes in order to facilitate the development and management of the scaling-up strategy.

For example electoral cycles can deeply impact the scaling-up strategy by introducing discontinuities *(e.g. when leading to the replacement of supportive politicians).* As they are highly predictable, they should be taken into consideration in scaling-up timetables. It may be wise to initiate scaling-up at the beginning rather than at the end of such cycles.

Other changes are less predictable. Nevertheless, they can also deeply impact the programme. Although most parameters can be predicted, controlling every parameter and its evolution would be counterproductive. It is generally admitted that about 90% of the project can be known and controlled and that it is useless and very expensive to try controlling the remaining 10%. For this reason, the project needs to **identify and assess the risks associated to this 10% of unknown or uncontrollable parameters and set-up an adequate monitoring and watch system** *(cf. STEP 3).* In addition, it is important to foster a constant dialogue between all project stakeholders since each of them has particular assets to be able to anticipate or notice changes in its area of competences.

9. See for example the project *"New Generation of Yaodong Cave Dwellings"* in China (http://www.worldhabitatawards. org/winners-and-finalists/ project-details.m?lang=00 &theProjectID=314)
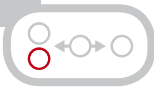
4 / Implementing partners

Implementing partners refer to individuals and organisations that are directly or indirectly involved in the implementation of the scaling-up strategy. It includes not only the adopting organisation staff but all project partners.

Step 1

Preliminary work: assessing model's
scalability and local specificities, defining
target groups and key stakeholders

Key questions

1. Does the originating organization have the desire and organizational capacity to expand its operations on a substantially larger scale? or is it more relevant to transfer the model to another adopting organization? or to scale up through collaboration with other organizations?

2. Who are the other main organisations that will catalyse the scaling-up process?

3. What are the responsibilities and tasks that can be handled by these organisations?

4. How synergies can be created between the involved organisations?

5. Have these stakeholders been involved in the design of the innovation and in the definition of the scaling-up strategy?

The implementation of a scaling-up strategy is anything but an ordinary project or process. Multiple technical, managerial, leadership and financial inputs are needed to support it. Thus, it is essential to identify whom are the stakeholders involved in the implementation of the scaling-up strategy and which are their respective roles and responsibilities.

Originating & adopting organisation [10]

Five main scenarios can be distinguished:

1. **Originating and adopting organizations are one and the same,**
2. **They are different organisations but with similar attributes,**
3. **They are different organizations with different attributes,**
4. **Adopting organizations can be numerous and work in partnership,**
5. **No adopting organisation: the model leads directly to spontaneous replication.**

Each of these scenarios has pros and cons as illustrated by the following example that details the case of replication through policy adoption— i.e. the transfer of a model from an NGO to public sector institutions (scenario 3):

"The clear advantages of policy adoption are mandatory compliance and access to resources, as state and national governments have greater financial resources than most NGOs. Moreover, governments generally have greater public legitimacy, especially if they are democratic; and donors and foundations frequently view operating at scale on a sustainable basis as a more appropriate role for government than for NGOs. On the other hand, organizational congruence— the match between the skills, procedures, and values of the NGO and those of the government—can be a serious problem. For example, where the model being transferred involves a highly participatory approach, adoption by bureaucratic public agencies may be impractical. For this reason, policy adoption is typically more effective when the model involved is primarily technical than when process sensitivity and community participation are key factors in its success." [11]

In any case, it is primordial **that both originating and adopting organizations are fully involved in the design of the scaling-up strategy** in order to guarantee its relevance. In addition, experience and theory [12] both suggest that many of the tasks involved in successfully transferring or expanding a model can be done most effectively with the assistance of a neutral third party charged specifically with preliminary works: pilot project evaluation and documentation, stakeholder mapping, identification of implementing partners and target groups as well as coalition building and partnerships. When the adopting organisation has not yet been identified at this stage, the originating organisation will need to clearly identify and list the competencies and specificities of the future-adopting organisation with the support of the third party when possible.

TOOL 2
provides the reader with further explanation regarding these scenarios, as well as advice for identifying the required skills and competencies of the adopting organisation.

10. The terminologies of originating and adopting organization are defined in the introduction (page 11)

11. Op. Cit. - R. Kohl and L. Cooley, MSI - 2004

12. Op. Cit. – WHO, ExpandNet - 2009

Mapping of actors

In order to include all relevant organisations or individuals in the scaling-up programme, **it is recommended to draw up a map of actors that designates explicitly all potential partners.** It is advised to adopt **a holistic brainstorming approach** with the main stakeholders, including, when possible, user organisations and organisations that work on other issues but may turn out to be partners for the mainstreaming of the innovation *(e.g. some department of education can take the decision to integrate bioclimatic considerations in the design of primary schools they will construct or refurbish)*. Box 8 suggests a non-exhaustive list of "actors" that need to be considered.

Typology of actors that need to be reviewed for the mapping

Box 08

Public Institutions	• National government *(e.g. ministries of environment, energy, housing, etc., executive agencies of concerned ministries)* • Local authorities and representatives
Non profit-making organisations	• Local and International Associations and NGOs • Cooperative (of production, users, credit & savings, etc.) • Self Help group • Women alliances • Federation of cooperatives • Community-based Organisations
Education & trainings	• Universities • Vocational Education & Training providers • Specialized Training • Institutes • Public research institutes
Private organisations	• Artisans • Private construction companies • Material suppliers • Contractors • Architects • Engineering or design offices • Banks & Micro-Finance Institutions • Services providers • Research institutes
Others	• Association or Federations of contactors/private companies • Donors and foundations • International cooperation & development agencies • Formal and informal networks

TOOL 3

provides methodological tools to carry out the mapping of actors.

Step 1

Preliminary work: assessing model's
scalability and local specificities, defining
target groups and key stakeholders
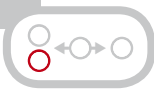
Assessing, monitoring and strengthening the resource team's capability to support the scaling-up strategy

Resource teams *(i.e. adopting organisation plus main partners)* are more likely to be successful in reaching scaling-up goals if they possess the following attributes:

- Effective and motivated **leadership** around an unifying **vision**
- **Credibility and legitimacy** towards user organizations
- In-depth **understanding of the political, social and cultural environment and users' needs and realities**
- **Ability to advocate in favour of the promoted innovation** with policy makers, government officials and program managers (including **policy makers or governmental officials in the resource team is a must**)
- Skills and **experience in scaling-up programmes**
- **Strong interpersonal communication and group facilitation skills** in order to facilitate and foster cooperation and information exchanges between partners and stakeholders
- Capacities and skills regarding:
  - **Participatory approaches**
  - **Technical aspects related to the innovation** and to carry out further **R&D activities**
  - **Awareness raising and communication campaigns activities**
  - **Organisation of trainings** for the implementing stakeholders *(i.e. artisans, construction companies, engineers, architects, etc...)*
  - **Resource mobilisation and fund raising** as well as development of **innovative financing schemes** *(e.g. micro-credit, tax exemption, carbon market, etc.)*
  - Fluency in the **local and regional languages**
  - **Planning and priority setting**
  - **Monitoring and evaluation**[13]

For more information regarding the assessment of adopting organisation competences, please refers to the tool 2.

13. Adaptation of op. cit. WHO, ExpandNet - 2009 (pg. 25- 27)

Step 2

Design the
Scaling-up Strategy

Once the preliminary work (Steps 1) has been achieved, it is time to define the Scaling-Up strategy. This phase implies identifying the main levers of action that can be activated in order to successfully expand model adoption to the desired scale.

The present chapter aims at providing project developers and decision makers with guidance and possible lines of approach to support them in the design of their OWN and UNIQUE scaling-up strategy.

This is the core chapter of the present manual. The levers of action are identified as the six pillars of the scaling-up strategy and are illustrated by the lessons learnt from six cases studies [14].

14. The full version of the six case studies are included in the attached CD or can be downloaded here www.saesup.org
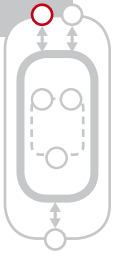
1 / Create an enabling political, legal and institutional environment [15]

To mainstream an innovation, political and legal environment are primordial. In the precedent chapter (cf. STEP 1-§3), the importance of assessing the existing political context and anticipating its evolution has been stressed on.

The present paragraph is pointing out how a scaling-up strategy could foster the creation of an enabling political, legal and institutional environment. However, it may be emphasized that for projects dealing with informal contexts, the creation of enabling policies is not necessarily relevant.

🔑 Key questions

1. How are governmental policies and political environment affecting the project?
2. Who are the key decision-makers on local, regional and national levels? *(actor mapping)*
3. Which arguments, appeals or advocacy strategy are likely to persuade key decision/policy makers and opinion leaders that the proposed model is successful, cost-effective and feasible?
4. Which strategy has to be set-up to disseminate the innovation amongst decision makers?
5. Which other activities can be carried out to foster an enabling political, legal and institutional environment?
6. How can relevant institutions' awareness, competencies and capabilities be strengthened? in use?
7. What other factors outside your control have had a positive or negative influence on your project's ability to be scaled up and/or transferred?

Promote Supportive Policies

As a very first step, **it is essential to inform the relevant national and local authorities departments of the existence of the promoted innovation and to insist on the relevance of this innovation** to face current issues they are dealing with as well as its cost-effectiveness and other advantages the innovation may have over alternative models.

Once decision makers are convinced about the importance to champion the model, the adopting organisation needs to work on the model's institutionalization (both with planning and budgetary mechanisms) and to promote policy changes or legal actions. **Government and local authorities have different options to foster an innovation** (implement regulation, financial or fiscal incentives, provide technical support and propose an enabling legal environment), for example:

- **Land policy:** making available well-situated *(e.g. close to the centre)* or economically competitive lands (or even for-free-lands) so as to foster the development of the promoted model *(e.g. construction of energy efficient buildings, social housing, inclusion of renewable energy systems).*
- **Fiscal policy:** Tax exemption for property tax or for the importation of needed appliances; supportive fiscal regulation for companies working on the sector concerned by the innovation, etc.

15. Most of the literature refers to the creation of an enabling political legal and institutional environment as *"Vertical Scaling-Up"*. i.e. when governments or other institutions decide to adopt the innovation on a national or sub-national level and it is institutionalized in planning and budgetary mechanisms, policy changes or legal actions.
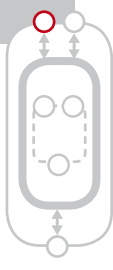
- **Building Codes, Norms and Standards** are coercive levers of action to enforce the development of renewable energy or energy efficient measures *(e.g. thermal regulation)*.
- **Legislation** is a powerful lever when the project is implemented in the formal sector where the legislation in force is respected *(e.g. banning of non-energy-efficient practices, cf. Box 9)*.
- **Pro-active policies:** direct integration of an innovation in national or local government policy or adoption of the model in their own programs. *(cf. example of PSH project, Box 9)*

However, **it is primordial to anticipate the change that a new policy, code or norm may produce before encouraging its adoption.** For example, under the Energy Efficient Housing project of the UNDP-Mongolia, new and simplified construction standards for Straw-Bale Buildings (SBBs) were developed and integrated in the building code. However, in practice, houses in Mongolia are not inspected or certified by any state agency and there is no penalty for not complying with the existing building regulation. Therefore, it is not clear whether the regulatory barrier (lack of applicable SBB standards) was in fact a major barrier to SBB commercialization in Mongolia.

Examples and impacts of Supportive Government Policies

Box 09

Biogas Support Programme, Nepal	**The Government of Nepal (GoN) has a long tradition, dating back 1975, for promoting biogas in Nepal.** The provision of low interest rate loans and subsidies for biogas systems is indicative of the government's support to promote this technology. In addition, the GoN incorporated, in the 7th Five-Year Plan (1984-1989), a target for the installation of biogas systems. In 1984-86, a subsidy representing 50% of the loans' interest was introduced for the families purchasing a biogas plant. Subsequently, this incentive was extended to provide a 25% subsidy on installation cost. The 8th Five-Year Plan (1992-97) defined the government institutional framework for developing Nepal's alternative and decentralized energy resources. As a result, the Alternative Energy Promotion Centre (AEPC) was established under the Ministry of Environment, Science and Technology (MoEST) in 1996.
Passive Solar Design, Ladakh, India	In Northern India, the Ladakh Autonomous Development Hill Council (LADHC) **proposed to introduce passive solar design in their social housing project (Indra Awas Yojna) as well as in public buildings** such as primary schools and Medical Aid Centres. The mainstreaming of the innovation in public buildings creates a virtuous spiral since they act as demonstration buildings and make people more confident in adopting the innovation for their own construction. In addition, contractors learn about these new techniques while constructing public buildings and then they are able to replicate them in the private buildings they are working on.
Ban of Fired Brick, China	Fired bricks construction requires great amounts of topsoil and firing the brick consumes large quantities of coal. **Chinese government realized the importance of this issue and banned the utilization of fired bricks in large and medium cities.** This new law has obvious direct impacts to decrease the production of fired brick and reduce its environmental impacts. In addition, most stakeholders involved in energy efficient building projects in Northern China agree to say that the ban of fired brick for the construction is definitely one of the determining points for the large scale diffusion of energy-efficient building techniques
Energy Efficient Housing in Northern China	Northern China suffers from very harsh winters and houses are poorly insulated. Partly thanks to two projects dealing with energy efficient houses (ADRA-China and FFEM/ADEME) in Heilongjiang province (HLJ), regional authorities are now fully aware of the challenge of energy efficiency in the construction sector and the bureau of construction is acting "pro-actively" to support it. **HLJ authorities' objective is to rebuild 85% of rural houses between 2008 and 2015 by integrating energy efficiency requirements.** One pillar of their policy is the distribution of subsidies (5,000 RMB) for new houses which design respects these requirements. Furthermore, they are training local authorities as well as key stakeholders on energy efficiency issues and granting some private companies for R&D activities on insulation materials.

Set-up of a favourable institutional framework

The setting-up of a specific department, agency, and governmental unit can be another pro-active policy to promote the development of an innovation. **The existence of a specific public institution with the adequate budget and human resources as well as the legitimacy to act independently is a perfect tool for the development of an innovation.** For example, the Alternative Energy Promotion Centre (AEPC) has been created, in Nepal in 1996, as the operational wing of the Ministry of Environment, Science and Technology (MoEST) to (1) recommend policies, (2) promote the development of appropriate rural energy technologies, (3) establish strong partnership between industries, NGO, governmental organisation, cooperatives, banks and donors, (4) establish a database, test station and information centre, (5) conduct R&D on Renewable energy technologies and (6) supervise, monitor and evaluate alternative energy programmes.

Another example is the setting-up of the District Energy and Environment Sections (DEESs). These units have been established under an UNDP programme and with AEPC support. They have three main objectives: (1) to coordinate local stakeholders at the district level (NGOs, banks, private companies, etc.), (2) to promote renewable energies solutions and (3) to monitor the renewable energy project implemented at the local level.

TOOL 4

provides the reader with practical tables to identify who are the relevant decision makers that need to support the innovation and to design a strategy to create an enabling political and legal environment.

Advocacy: Promoting the integration of the model in local and national policies

There are numerous ways for an adopting organisation **to advocate the mainstreaming of an innovation amongst policy and decisions makers.** The strategy to be adopted is obviously fully dependent on the local political, social and institutional context, as well as on the position and role of the adopting organisation and its relation with the government and local authorities. It is essential to associate public authorities and policies makers during both the design and implementation of the scaling-up strategy. **Appropriation of the decisions by these actors is a key to success as it facilitates mainstreaming of the innovation.**

Passive Solar Housing (PSH) in Ladakh (GERES, India)

Box 10

Advocacy to national level	In April 2009, GERES organised an international seminar on "Energy and Climate Change in cold regions of Asia". This seminar was the opportunity to promote the comparative advantages of PSH in Ladakh context. Different personalities from the Ministry of New and Renewable Energy of India (MNRE) and of The Energy and Resources Institute (TERI) were present and have been convinced by PSH thanks to the presentations and field visits made during this seminar. Fortunately, this seminar happened while the MNRE was sub-contracting TERI to study the potential of the renewable energy in Ladakh. Partly thanks to this seminar and other advocacy efforts made by different people on different levels toward TERI and MNRE, the "Renewable Energy Plan for Ladakh" includes a component on passive solar buildings (both for housing and public buildings), which would probably not have happened had it not been for the opportunity to promote advantages of PSH during the seminar.
Steering committee	In Leh and Kargil districts, steering committees have been set up by GERES in order to create awareness about passive solar technologies and benefits amongst the decision-makers of the Ladakh Autonomous Hill Development Councils (LAHDC) (local district authorities). The main objectives of these steering committees consist in: (1) Involving decisions makers in villages selection process, (2) Reviewing project progress and results, (3) Developing a Building Code on energy-efficiency for public buildings and (4) Integrating energy efficient techniques in public buildings (standard designs). The involvement of decision-makers in steering committees has proven to be a very efficient way to make them aware of the relevance of passive solar architecture, leading to strong political decisions for the integration of passive solar design in public buildings and social housing projects.
Grassroot network	Grassroot networks have been set-up on the level of villages, clusters or valleys, to play an important role in ensuring the grassroots participation in the project (awareness raising, selection of poorest families and validation of the final list) as well as to act as a pressure group to advocate policy for PSH development to district authorities with proximity NGOs' assistance. These networks are composed of proximity NGOs, village representatives, end users and the private sector (masons, carpenters, etc.). The organisation in networks has been an efficient way to convince local representatives of the advantages of PSH and to guarantee that they will promote the innovation during Hill council meetings.
Trainings for Governmental Practitioners	Thanks to the demonstration effects of the project and steering committees, decision-makers have been convinced of the relevance of passive solar buildings and have made political announcement to broadly introduce solar passive designs. The next step has been to train governmental engineers. These trainings aim at developing awareness amongst civil engineers, to give them theoretical know-how to integrate energy-efficiency and passive solar techniques in public buildings and training them on design. In addition, standard designs for primary schools and Medical Aid Centres have been conjointly drawn with GERES.

Step 2
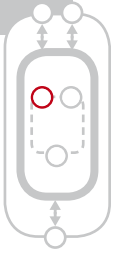
2 / Demand generation: Communicate on an innovation and support its local adoption

Demonstrating that a technology is relevant, cost-effective and useful does not necessarily lead to its spontaneous scaling-up.
Once target groups have been clearly identified, it is essential to promote the model by developing relevant dissemination activities and supports and using the good channel of communication.
Communication strategy must be tailored to each key audience.

Key questions

1. Who is the key audience (policy-makers, managers, private sector, cooperatives, donors, users, etc.) and which are their informational needs? How do they perceive the innovation's benefits?
2. How can dissemination and advocacy approaches be tailored to each audience?
3. Are dissemination channels used in the pilot phase relevant for the scaling-up strategy?
4. What are the other channels (media, social marketing, leaflets, meetings, local information agencies, etc.) that can be mobilised to widely disseminate the model amongst the key audience?
5. Are required information and data easily available and tailored to each key audience?
7. Are the demonstration sites appropriate in terms of localisation, number and typologies? (e.g. is it relevant to demonstrate in public buildings – for ex. Primary schools - a model that is aimed at being scaled up in individual housing?)

Identification of the key audience and design of the Promotion Strategy

In order to generate the demand, promotion and advocacy efforts should not focus only on end-users. **There is a multitude of stakeholders that need to be informed about the model and convinced of its relevance and its comparative advantages over other models.**

A specific communication strategy should be designed for each key audience taking into account local context peculiarities. For example, advocacy strategy targeted at policy-makers would probably focus on individual meeting, while activities aiming at influencing policies would focus on dissemination in the specialized press or via Internet. By opposition, for end-users in rural areas the strategy would probably more focus on short leaflets or drawings, radio broadcastings and village meetings.

Hereafter are key steps to design the communication strategy:

1. Identify the main channel of communication
2. Identify the key-audience *(i.e. target groups)*
3. For each audience, identify what is the needed information and how it can be collected
4. For each audience, identify what are the more relevant channels of diffusion and how the information has to be presented
5. Define SMART objectives for the communication strategy *(cf. Box 27)*

TOOL 5

provides the reader with a step-by-step methodology to design the communication strategy.

Feedback mechanisms

Communication is a two-way information flow where feedback mechanisms are essential. It should not be delivered in the manner of one-way traffic without paying attention to the level of understanding of those who received the information. Critics and suggestions from stakeholders including from the immediate beneficiaries, should be well noted. The information providers should also cultivate the habit of carefully listening and develop the skill of paraphrasing and analyzing the message received. Indeed, certain careless actions and hurriedly efforts sometimes may create unintended results, as illustrated by the Box 11.

Example of communication failure

Box 11

In Africa, a health educationist very enthusiastic in the pursuit of an effective communication with the help of a poster happened to share the picture of a mosquito. It was an enlarged picture to enable viewers to see clearly every part of the insect including its sharp nozzle with which it would pierce the skin of the human victim and inject the malaria parasites. He saw this picture as an efficient tool to communicate on the real cause of the disease and encourage people to get rid of mosquitoes. To his bitter disappointment, he happened to hear people's reactions to his lecture: people thought they were fortunate to live in Africa where they did not have mosquitoes as big as shown on the poster and hence did not have to worry about contracting the disease. This is an example of a message which was wrongly received and interpreted and shows that the use of communication tools can be have unintended consequences.

Printed documents, media and ITCs

Booklets, leaflets, posters and other printed documents are the traditional channel of dissemination. **Documentation needs to be tailored to each audience by adapting the number of pages, the ratio between text and drawings as well as the language.**

Both TV and radio are quite efficient way to encourage the adoption of an innovation. They can reach a broad number of people with a better impact compared to written information and are generally cost-effective *(cf. Box 12)*.

When possible, it is **worth assessing the possibility to innovate by using ICTs (Information and Communication Technologies).** Some practical example are available on the Practical Action website.[16]

Successful Promotion strategy and Media Campaign (GERES India)

Box 12

In order to promote their Passive Solar Housing (PSH) programme in Ladakh (northern India) the NGO GERES has set-up both radio and TV awareness raising campaigns

A series of two emissions was broadcast on All India Radio (AIR) in winter 2008/09. During the following winter 2009/10, a series of 9 emissions were broadcasted just after evening news which are listened by most villagers. The radio programme mentions prices, techniques and benefits of PSH and includes testimonies. In addition, a 20-minutes TV documentary in Ladakhi was broadcasted on local TV channels. TV programs are probably more effective to promote the innovation, but as the channel is available only in the vicinity of mains cities, the impact in rural areas is more limited compared to radio programmes. In addition, the documentary film is also available in DVD, and used to present PSH to decision-makers as well as to be displayed in classrooms or distributed in villages. It is currently under translation in Urdu and Hindi.

These campaigns have been very successful since, after listening to programme, many people directly contacted the NGOs to get more information regarding the project and PSH techniques. In addition it is very cost-effective since they reach a broad number of people while being quite cheap (~1.3 € per minute to broadcast the emission on All India Radio (AIR) in Leh District) and saving NGOs time and resources.

16. http://practicalaction.org/icts-10
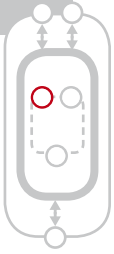
Village meetings

Village meetings are a traditional but efficient and interactive way to promote an innovative model and encourage its adoption since families can directly ask their questions to people in charge of the promotion.

Promotion strategy based on social and commercial marketing (BSP-Nepal)

Box 13

To promote biogas technology amongst villagers, BSP-Nepal is acting at different levels (national, district, local) and combining numerous methods (written documents, posters and calendars, radio and TV programmes, exhibitions and fairs, etc.). **At the community level, BSP-Nepal has divided its promotional strategy into social and commercial marketing depending on the level of penetration of biogas plant in the area.**

In areas where biogas has already been introduced, the Biogas Construction Companies (BCCs) are the main actors for the promotion and are in charge of developing their own market. They receive Management and Promotion Trainings from the Nepal Biogas Promotion Association (NBPA) to enhance their marketing skills. They also received some brochures, pamphlets and posters to support them in their action. In addition, they can ask NBPA to tailor and broadcast radio spots in their area of intervention.

In areas where penetration is low, BSP-Nepal works with local partners and authorities to organise village meetings so as to promote the benefits of biogas plants and available technical and financial supports. As BSP-Nepal could not organise all the village meetings all over the country, they set-up a partnership with the National Cooperative Federation of Nepal (NCF-N) that is in charge – through its local members - to organise village meetings in the concerned Low Penetration districts.

A NCF-N trainer, specialized in biogas issues, comes and explains about the benefits of biogas plants, the procedures of installation as well as financial support that villagers can receive. NCF-N also supports the local Credits & Savings Cooperative to develop biogas related loans.

Generally, a representative of a BCC is present during the meeting but does not intervene. It is only at the end of the meeting, when some villagers are convinced but ask *"OK, sounds good. But now, how can we get one of those biogas plant?"* that the BCC representative is introduced. Thus, convinced households can directly be in contact with the BCC and even sign "order forms".

Some lessons learnt to organise successful villages meetings are:

• Use **interactive and attractive communication supports** *(posters, DVD, PowerPoint presentations or ICTs)* in local languages.

• As the number of village meetings will increase as scaling-up proceeds, the implementing organisation will, in most cases, not be able to organise all of them. Thus, it is **essential to work with local representatives and create partnerships with federations and other regional or national networks that will be in charge of organising the meetings** through their local members.

• **Promotion of the innovation via a public voice** *(e.g. cooperatives, local authorities, NGOs or CBOs)* is very efficient since they know local language and culture and they generally have long-term commitment with villagers or end-users. For example, the local NGOs in charge of the Passive Solar Housing (PSH) project, that have been working in some villages for more than 15 years, asserts that they need to put two or three times more efforts for promoting PSH in villages where they have never previously worked. In addition, people have more trust in those organizations than in private companies that they have never seen before. But, as private companies or local artisans will be in charge of the implementation, it is advisable to invite them to participate to the meeting *(cf. Box 13).*

Demonstration sites and exposures visits

"Seeing is Believing": **people will be more likely to adopt a new model if they can test it without committing themselves to complete adoption.** It is advisable to develop demonstration sites and organise exposure visits where potential users can experience, touch or feel the benefits of the model and speak with people who already adopted it.

While promoting renewable energy systems or energy-efficient buildings for individual households, the question whether demonstration should focus on public buildings or on individual houses comes back regularly. The final evaluation of the Energy Efficient Housing (EEH) project in Mongolia pointed out that the construction of fully funded institutional and social straw-bale buildings as demonstration sites was not an adequate way to promote the commercialisation of straw-bale private houses. This report concluded that demonstration buildings are far more effective when they are in the same sector and use the same modalities *(e.g. subsidies schemes)* that the ones that are expected for replication[17]. On the other hand, other practitioners argue that public buildings are a good way to promote an innovation for different reasons: (1) it is easier to implement a new technique in public or commercial buildings rather than in houses, and (2) if a technique is demonstrated in public buildings people will be more confident to implement it in their own house. Moreover, villagers may be mobilized for the construction of a public building *(e.g. school, community building)* thereby gaining a first experience with the innovation. There is probably no universal answer to this issue, and it should be discussed with all the stakeholders during the definition of the scaling-up strategy.

Density and repartition of demonstration sites are another important issue to be discussed while designing the scaling up strategy: *Is it more efficient to realise few demonstration sites in many villages or to concentrate the demonstration sites in few villages?* Both strategies can be considered and the choice should be discussed through a participatory approach.

Quality of implementation

It is essential to be vigilant regarding the quality of the construction, the product or the service (according to local standards) **especially when the innovation is demonstrated for the first time in a given area. One single counter-reference can jeopardize all the efforts done previously in the area.** This is particularly true for the promotion of energy-efficient houses since the construction sector is very conservative. Common elements that succeed in guaranteeing high quality products, constructions or services are:

- **Prequalification** of equipment suppliers, construction and installation companies and craftspeople (e.g. masons, carpenter, etc) to be eligible for subsidies or incentives;
- Developing **guidelines and technical standards** to be followed stringently (labelling, branding, certifications, etc.);
- Including **performance guarantee** in contract with suppliers, construction companies and craftspeople;
- Develop a **brand or a label** in order to associate an image of quality to the innovation to facilitate the innovation identification and its promotion. This is also a good way to avoid counter-examples that can be introduced by bad copies or spontaneous replications that do not respect either the characteristics or the requirements of quality.
- **Educating end-users** regarding the responsibilities and obligations that construction companies or craftspeople have towards the work done *(e.g. After Sale Services).*

Make Users the Ambassadors of the Technology

Another reason to foster good quality of implementation is the satisfaction of end users. If the innovation's performances are good and correspond to end users' expectations, they will tend to promote the innovation amongst relatives, friends and neighbours. By doing so, they will publicize the model as well as the company or NGOs that implemented it, leading to a virtuous spiral:

Good quality = Satisfaction of the user = Best solution for promotion
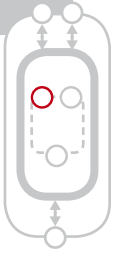
Information/Resource Centre

The creation of a resource centre is a structural action to strengthen both demand and offer. It needs to be an acknowledged and legitimized place to the eyes of users where citizens, professionals and decision makers can receive information regarding the innovation *(e.g. technical, economic and fiscal aspects, list of professionals, etc.)*. In addition, resource centres can provide trainings for professionals, develop R&D activities and propose a demonstration site.

Example of Resource Centres

Box 14

Energy Efficiency Centre (UNDP – Mongolia)

As part of the Energy Efficiency Housing project, Energy Efficiency Centres (EEC) have been set-up. They are considered by most project stakeholders as one of the most successful output for awareness raising activities as well as for capacity building. For the management of those centres the project has called upon the services of national NGOs and universities.

In addition to providing general public with information regarding straw-bale building and energy efficiency, EECs are also key stakeholders to train professionals (architects, engineers, building workers, etc…), as well as to link demand and offer by giving a list of providers and construction companies specialized in EE and SBB. One of the EEC offer thermal inspection services and is in direct link with the university.

The main challenge EECs are facing is the financing of their activities. Most of their funds come from trainings and thermal inspection services they are providing as well as members fees. This is not sufficient to cover all the costs related to public good services they are offering. Public funds are still needed to run these centres.

PSH Resource Centre (GERES - India)

In order to foster mainstreaming of Passive Solar Housing (PSH) and energy efficiency after the project end, GERES and local NGOs are thinking about the creation of a "Resource centre". Such a centre will promote these techniques amongst private individuals as well as professionals of the construction sector and local representatives (at block and district level).

Firstly, an information centre will be setup to provide the potential users with information regarding PSH and energy-efficient constructions. The centre will also inform masons or other construction professionals by giving them technical inputs and direct advice and propose them existing trainings.

In a second step, the information centre will be transformed in a resource centre which potential activities are detailed in the appendix 6. Its business model is under elaboration. It will combine free services and economic services and products. The centre's financial resources will come from 3 sources:

- National and international public funds and subsidies
- Fees from members
- Profitable activities (exhibition areas, consultancies, trainings, etc.)

Best Practices Workshop (CESEF – Nepal)

In order to promote CESEF material the project has set-up a small "best practices workshop" in order to:

- **Test material quality and resistance.** The small testing laboratory set up by CESEF can test the compressive strength of blocks and other cement materials to demonstrate their quality and to overcome the big mistrust of cement-based building materials.
- **Share best practices.** Best practices developed by the R&D activities held in the workshop or by other project partners are shared with stakeholders (masons, petty constructors, etc.) on a monthly basis during the "Best practices sharing workshops".
- **Develop synergies with the private sector.** The "Best Practice Workshop" has been established inside an enterprise. This decision has proven to be the right one since this collaboration helps CESEF team to better understand entrepreneurs' point of view and to adjust the programme to their specific needs. In addition, it is a good way to promote the new techniques amongst the customers of the company.

Funding of the resource centres

The financial sustainability of such centres remains challenging and sometimes problematic. A part of the centre funds can come from economic activities such as the sale of products and specialized documentation, rent of rooms for the exhibition of commercial products, trainings and expertises. However, it is **not realistic to expect a resource centre to cross-subsidize public good information and activities** (e.g. free advices and documentation, awareness raising campaigns and activities) **from their other commercial operations** and **public funds appear to be indispensable.** In a short and midterm those funds could be delivered by international donors, but on the long run participation of national and local authorities is most probably required.

TOOL 6
illustrates the missions, services and products that a resource centre specialized in the promotion of renewable energy and energy efficiency can offer.
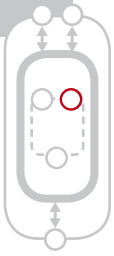
3 / Offer strengthening: Training of professionals and strengthening supply chains

The third lever of the scaling-up strategy is related to competency building and strengthening of supply chains. The scaling up strategy will imply to train large numbers of users, professionals and craftspeople, thus trainings will need to be systematized and monitored.

In addition, implementing meaningful large-scale change almost always calls for the strengthening of implementing organizations.

Last but not least, supply chains will need to be created or structured and Research & Development needs to be performed in order to constantly adapt and improve the promoted model.

Key questions

1. Who are the stakeholders whose capabilities will need to be strengthened *(e.g. craftspeople, construction companies, public authorities, banks & MFI, etc.)*?

2. What are their needs in terms of skills, methodologies and tools to implement the innovation *(e.g. technical trainings, toolkits development, knowledge transfer, trainings on administrative and marketing issues)*?

3. What are the resources and tools available to provide required trainings? How can they be mobilized or created when they do not exist?

4. Who are the training organisations than can be involved in strengthening competencies *(e.g. universities, institute of technology, training providers, Vocational Education trainings, etc.)*?

5. Should specific curriculum be developed with an existing university or other training institutions?

6. What R&D activities are required and which organisations can carry them out? be strengthened? in use?

7. How can the ability of the implementing organisation and its partners to support the innovation be strengthened *(e.g. technical knowledge, logistics and project management, trainings providers, communication, development organisation, advocacy, etc.)*? on your project's ability to be scaled up and/or transferred?

Competency Building of Professionals via trainings[18]

Identification of people and organisations that will implement, install or construct the innovation and how they can be trained.

First step is to identify who will effectively implement, construct or install the innovation:

- Who will be in charge of installing the photovoltaic system? For example, is it the same company that the one that will sell the system? Is it the adopting organisation? Or a private company specialized in the installation of these panels?
- Who will construct the house: a private company, local masons or the owner himself?

When private companies implement installations or constructions, it is easy to identify, inform and train the professional whose capacities need to be strengthened *(e.g. technicians, architects, engineers, foremen, masons, etc.)*. However, when houses are constructed by their owners, it is much more difficult to organise trainings and to guarantee homeowners participation, and to train non-professional builders.

Trainings

Once the target groups for training have been identified, training sessions need to be tailored to their audience in order to provide them with adequate design, construction and operation & maintenance skills, using specific training approaches and materials for each target group. When dealing with private companies and independent workers, it may be necessary to complete these "technical" trainings with management, accounting, communication and marketing skills.

Typologies of trainings

Box 15

	Users	Private companies	Engineers/ architects	Individual workers/ craftsmen[1]	Project Implementing organisation(s)	Local authorities[2]
Advanced Design (theoretical approach)		○	●		○	○
Basic design/ layout	○	●		○	○	○
Installation/ construction	○	●	●	●	○	○
Benefits and advantages	●	●	●	●	●	●
Operation and maintenance	●	●		●	●	
Quality		●		●	●	
Communication and marketing		●		○	●	
Financial and Business Management		●			●	

● The necessity such training depends of the project context.
○ Advised trainings be done.

(1) For examples, masons, carpenters, etc.
(2) Both technicians and/or policy makers.

When possible, trainings should rely on interactive and dynamic presentation supports *(e.g. posters, PowerPoint, DVDs or ICTs)*. In addition, trainings will preferably be based on participatory approaches by fostering the participation of trainees and creating interactions and constructive exchanges. Last but not least, experience illustrates that it is worth planning to organise reminder and follow-up sessions to both strengthen trainees' skills and receive feedbacks on trainees' field experience so as to improve trainings' content and supports.
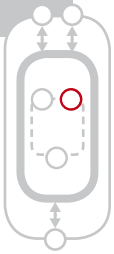
Monitoring and Evaluation of training sessions

Monitoring and evaluation of training sessions are essential to **guarantee trainings' quality as well as the understanding of key messages.** As illustrated in the Box 11, trainings need to be based on feedback processes between trainers and trainees. This approach will enable trainers to assess whether the message has been clearly understood by trainees. In addition, it will help to adapt and improve by incorporating their remarks and feedbacks.

As the innovation will evolve as scaling-up progresses, it is important for trainers and implementing organisations to receive feedbacks of the problems faced during implementation/construction of the innovation as well as the tips or new solutions/approaches developed by trainees. By capitalizing all this information, trainers and implementing organisations will be able to constantly improve the innovation and simplify its implementation.

In conclusion, trainings should ideally include:

- A questionnaire that is sent to trainees prior to the training session to assess the level of knowledge and skills and to determine what are their expectations,
- An introduction session with presentation of trainees and explanation of their expectations,
- Questions & answers sessions as well as exchanges between trainees,
- An intermediary and final evaluation of trainings by trainees to collect their feedbacks, to point out the strengths and weaknesses of the training as well as to assess whether the training meets their needs and expectations,
- A questionnaire that is submitted to trainees one or two year(s) after the training in order to assess whether it was useful for them in their daily work, what are the difficulties they are facing, whether they need a reminder or advanced training session and what are their recommendations to improve the training sessions' usefulness.

Competency building at the
"bottom of the pyramid" (BSP Nepal)

Box 16

Biogas Support Programme (BSP) in Nepal works towards building the capacities of poor people working in the supply chain, mainly the biogas masons. Biogas companies employ around 2,000 masons directly, who in turn employ trainee masons. BSP works towards improving the working conditions, skills and employability of biogas masons in a number of ways.

- The **masons receive biogas construction training** from BSP. After a **skill testing examination** realised by the national Council for Technical Education and Vocational Training (CTEVT), they upgrade from Level 1 to 2, 3 and 4.
- This **progressive skill enhancement national system is linked with progressively higher authority** allowing masons to hire other trainee masons below them.
- BSP works with private sector companies to protect the **masons' basic rights as workers.** The **minimum wage** for biogas masons is specified in the quotation and in the Code of Conduct.

In this way, people in precarious situation and barely-literate rural people get an opportunity to break out of poverty; a mason can easily earn NPR 62,000 or USD 817 in 6 months. Many BSP masons go on to become master masons in other construction work.

Scaling-up competency building
via Training of Trainers (ToT)

During a scaling-up process, **it may be relevant to turn to training providers** for different reasons:

- The important number of people that need to be trained may surpass the implementing organisation's capacities and/or competencies to deal with trainings.
- The outsourcing of the trainings to training providers is generally more cost-effective.
- Existing training providers are already working on trainings similar to the ones that need to be set-up within the programme or dealing with similar fields of expertise.
- Synergies can be created with existing projects such as, for examples, employment for youth and underprivileged groups *(cf. Box 17)*.

In some specific cases training providers can work without external funds if the demand is sufficient and the trainees can pay for the sessions. Nevertheless, in many cases, the programme will need to fund, at least partly, training providers.

When trainings are externalised to training providers or organised by different organisations it is necessary **to create a standard curriculum and specific training material** in order to guarantee that the quality of trainings will be equivalent from a training provider to another.

Training of Trainers (ToT) are essential to bring trainers to the level of technical knowledge and facilitation skills required to train others. Experience tends to demonstrate that a condition to guarantee the success of the ToT is that trainers' selection criteria include significant field experience.

TOOL 7
supports the reader
to identify training
needs for project
stakeholders and
partners.

Externalising trainings to training providers (CESEF – Nepal)

F-Skill has been initiated by the Swiss Development Cooperation (SDC). Its main objective and specificity is to offer trainings for unemployed youths from disadvantage groups in order to enhance their integration on the employment market. The impact assessment of the activities carried out by the organization is not based on the number of trainings organised (or people trained) but on the percentage of trainees that are effectively working as a direct result of the training they received.

Now F-skill is a private company that provides trainings through a franchise model system all over Nepal. Trainings provided by F-skill via its franchises are mainly commissioned and funded by international organizations (SDC, UN habitat, etc.), communities or by the central government.

Funds received by the training providers (franchises) for the sessions they organise is based on:

- The success of training to generate employment: if the trainees are effectively working 6 months after the end of the training, the totality of the training cost is taken in charge plus an additional incentive ranged from 15 to 70% of the training budget. Conversely, for the trainees that are not working, only 50% of the training costs is taken in charge.

- The share of disadvantaged youths amongst the trainees: the incentive rate depends of the group the trainee belongs to, the more the trainee is disadvantaged, the higher the incentive is.

CESEF programme has worked with F-skill to carryout trainings regarding the Rat Trap Bond (RTB) construction technique. Trainings of trainers have been organised for 50 trainers of F-Skill and more than 300 people received training on RTB construction techniques. As F-Skill objective is to generate employment, they were not training masons on RTB but rather unemployed youths on construction skills in general with a 3-days complement focusing on RTB techniques.

Technical training material
(Manuals, handbooks, DVD, catalogues of layouts, etc.)

During the replication phase, training materials are essential elements for transferring learning. Technical manuals and handbooks are relevant way to disseminate technical information amongst artisans, foremen, engineers and architects. They need to be adapted to the target audience in terms of content, complexity of explanations, length, language and the share between drawings and text. Ideally, materials must be developed by qualified training experts and must adhere to pre-established training standards to ensure high quality. The objectives of these documents could be numerous: reminders for trainees, diffusion to professional that did not participate to trainings, support for trainees that would like to teach the techniques to others, etc.

The diffusion of these documents may be done during training sessions and by making them available in partner organisations offices, resource centres and other place visited by the target audience. In addition to these guides, it may be relevant to produce pedagogical and practical DVD that will display the techniques of implementation and construction of the innovation [19].

For projects dealing with energy-efficiency (EE) designs for buildings it may be relevant to develop some catalogues of buildings blueprint that can be broadly disseminated amongst architects, engineers, foremen or users communities. This will favour the development of EE constructions by mainstreaming ready-to-use designs. For example, the Harbin Institute of Technology (HIT) School of Architecture compiled a book of 24 EE houses designs that is distributed by the Harbin municipality. The strength of this catalogue is to propose designs tailored to the diversity of the population living in Heilongjiang province such as poor farmers, well-off families, Korean native farmers and specific social and cultural groups.

Certification

A certification system should guarantee that professionals have the necessary competences and knowledge to implement the innovation and thus guarantee the quality. The certification may also be a necessary condition for the attribution of subsidies or other financial or technical incentives. Certification systems need to be designed depending on programme needs and local context. In addition, it can introduce a ranking or propose different level of certification (e.g. basic, intermediary and advance) with their respective levels of responsibilities and remuneration. In most cases, the certification will be delivered at the end of the training sessions but it may be worth conditioning it to an internship.
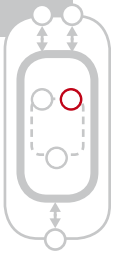
Certification and Grading (BSP - Nepal)

Box 18

To benefit from the subsidies scheme, Biogas Construction Companies (BCCs) have to receive a certification delivered by the NGO Biogas Sector Partnership – Nepal (BSP-N). All certified companies have to define annual targets with BSP-N and the quality of their services is assessed via a "grading system".

For each plant, BCCs send a completion report as well as the yearly maintenance reports to BSP-N. At least 10% of the plants constructed by a company are controlled after completion to check quality of construction or during the two years following the completion to control the quality of the After Sale Service (ASS). Gathered data and quality indicators (number of plants constructed, average defaults in the construction, quality of the ASS, etc.) are used to calculate the Biogas Performance Index (BPI) of the company. The grading scale is divided in 7 categories ranged from "AAA" (Excellent) to "E" (Very poor). BCCs are imposed penalties when the biogas plants do not meet required quality standards. This way, the companies are held responsible for the quality of their work. Companies under upper grades ("AA" and "AAA") receive additional monetary incentives.

If a BCC is qualified as D or E grade, NBPA meets it in order to identify the reasons of those poor results. Based on the conclusions of this assessment, the company receives trainings adapted to the identified weaknesses (e.g. human resources management, marketing, accounting, technical trainings, etc.). If a BCC is ranked as "E grade" for two consecutive years, it loses its certification.

Research & Development (R&D)

Along a scaling-up process, R&D activities need to be carried out in order to improve the innovation while decreasing implementation costs in order to favour its replication. R&D activities can be done directly by the implementing organisations, in cooperation with universities and research and/or by supporting (financially and/or technically) private researchers. It is generally advised to support public research rather than private research that will only benefit to one single company. But in some specific cases, R&D call for projects organised by the local/national government or the adopting organisation can stimulate innovation.

In addition, in most cases, the question of diversity vs. standardisation of the innovation needs to be discussed, both approaches having their pros and cons. Experience tends to demonstrate that during first stages of scaling-up process the number of promoted design needs to be limited (1-3 seems to be an adequate number and 5 a maximum)[20]. This has the advantage to simplify the project implementation in terms of trainings, R&D, follow-up and quality monitoring. In the meantime, R&D activities can be carried out without interfering with the scaling-up strategy. In a second stage of development, other designs may be gradually introduced – in parallel with the scaling up process – in order to stimulate innovation and to offer a wider range of solutions that will better match the needs and expectations of users. The number of alternative models that need to be designed is commonly proportional to the diversity of the area (in terms of climate, geography, culture, economy and availability of human and natural resources, etc.).

Universities and Vocational Education Training (VET) Curriculum

When innovation deals with the formal sector, it may be worth working with universities, Vocational Education trainings or other educational institutions. When a programme is looking to mainstream an innovation **it is a must to include the specific knowledge and know-how related to the innovation in standard universities and other educational institutions' standard curriculum.** For example, the Urban Integrated Development program of the GTZ in Mongolia focuses their efforts on the TVET (Technical Vocational Education & Training) that they describe as "the backbone of the knowledge-based economy and construction sector". This is particularly relevant in Mongolia where Mongol construction companies are lacking the skills to be competitive with Chinese companies. One objective of GTZ program is to improve the quality of TVET trainings by strengthening teachers training and management capacities, developing new manuals oriented towards the changing requirements of labour market and new technologies (especially Energy Efficiency) and establishing cooperation with the private sector to develop on-the-job-trainings.

20. More information can be find out in the case studies Passive Solar Housing (GERES, India) and Biogas Support Programme (Nepal) are included in the attached CD and can be download on the website: www.saesup.org

Supply chains and creation of a sustainable market

In order to successfully mainstream an innovation, **it is primordial to set-up and strengthen the supply chains. To do so, the programme needs to:**

- Identify the existing supply chains and focus on improving them rather than creating new ones
- Verify that primary resources are easily accessible and available in sufficient quantities
- Ensure people who need these resources are fully aware about where and when (especially for natural resources) they can get them
- Ensure that builders have the capacity to estimate the demand and to anticipate the quantities they will need to purchase or store.
- Verify that companies or service providers make sufficient promotion to raise awareness of the existence of the product or service and its quality.
- Ensure material transportation can be easily organised at an affordable cost (for the costumer).

Some examples of barriers that limit the development of the supply chains are:

- A Lack of an established chain of manufacture and supply of straw-bales in local areas
- Limited availability of cost effective and efficient baling machinery for SB production
- Lack of local level carpenters with both the technical and financial capacities to produce good quality frames for solar passive houses.
- Limited availabilities of locally produced equipment for biogas plant and insulation material.

Supply chains have to be pictured as a succession of steps linked together. If a single link is not working well, it affects the whole supply chain. Thus, the implementing organisation needs to identify all stakeholders involved at each step of the supply chain, and to design the scaling-up strategy in order to strengthen their technical, financial and managerial capabilities. In some cases, the scaling-up strategy will focus on the creation of new links such as workshops for the production of material, importation channels or service providers to name but a few.

Creation of a sustainable market: Linking demand and offer

Market creation is a long-term process that requires reaching a critical mass in order to be sustainable. Market development does not happen by itself, and most often, the private sector steps in only when the volume of goods or services sold allows for a profitable supply chain to be put in place. Experience shows that the existence of demand and offer is a necessary but not sufficient condition, **and special attention must be paid to link demand and offer in order to create a sustainable market** *(cf. Box 19)*. In addition, as far as social approaches are concerned, it is not obvious to ensure that the private sector propose their commercial products or services to poor and remote families while maintaining a viable business model.

Lack of link between demand and offer: EEH project (UNDP Mongolia)

Box 19

Energy Efficient Housing (EEH) objective was to mainstream Straw-Bale Buildings (SBB) in Mongolia. Project stakeholders considered to have succeeded in generating the demand (SBB are attractive with a subsidy of 20%) and public and decision makers have a high awareness of SBB and of buildings insulation. Moreover, the EEH project final evaluation stipulates that necessary technical conditions are now in place and that appropriate SBB designs for Mongolian conditions have been developed and disseminated. In spite of the success of the EEH project, no more SBB were built after the project end. This is partly due to the termination of subsidies, making SBB less attractive.

However, another major reason is most certainly the unavailability of straw-bale on the market. Straw needs to be dried and baled in autumn, stored in winter and transported and distributed the following spring, at the beginning of the construction season. At present, no private companies wants to do this work because nobody knows if it is a profitable market or not. As long as no company will bale the straw and make it available on the market, no more (or very few) SBB will be built. In conclusion, **both offer and demand exist but no SBB are constructed since potential users do not know where they can purchase straw ball.** In order to resolve this issue, BEEP project (successor of EEH project) plans to promote the Energy Efficiency centres (cf. Box 14). Their first duty will be to buy and store straw ball in order to make them available during the construction season. Secondly, they will work to strengthen supply chains and link demand and offer (e.g. provide building's owners with lists of companies with SBB construction skills and of EE material providers).

TOOL 8

provides more information
on designing a strategy
to strengthen supply chains.
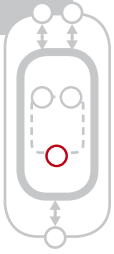
4 / Financial incentives
for the promotion of the innovation

Energy efficiency and renewable energy projects lead to significant savings (in fuel costs and/or time) for users. Savings should be carefully estimated and compared to investment costs in order to assess the potential benefit of the innovation. In addition, the development of intermediate technologies implies R&D activities in order to match investment costs to users' investment capacities and needs.

Although an innovation may prove to be profitable, poor people and sometimes middle class people may not be able to pay for the initial investment. Thus subsidies, loans, micro-credits or other financing schemes need to be set-up to make the innovation affordable to them.

As scaling up proceeds, the innovation will go through different phases of market development, and typically rely on an evolving combination of funding sources and financing mechanisms.

Key questions

1. What is the innovation cost-benefit ratio? Are economies of scale possible?
2. What are the target group's investment capacities?
3. What are the relevant financing mechanisms (subsidies, loans, etc.) in the project context?
4. How can they be mobilized?
5. How could we provide consumers with a broad choice of locally appropriate financing options?
6. Is collaboration with similar initiatives possible?
   And is it leading to benefits thanks to economies of scale?

Subsidies

Direct subsidies to end-users are one of the most common financial mechanisms aiming at making the innovation affordable and attractive. As far as subsidies to end-users are concerned, it is essential to take the following points into consideration:

- **Participation in kind of the users** (in local material, labour, etc.) **needs to be estimated and incorporated.**
- **Balance pros and cons of monetary subsidies compared to support in kind** *(e.g. construction materials, trainings, support of skilled/trained masons, etc.).*
- **Subsidy schemes can support strategic choices and orientations.** *(Cf. Box 20)*
- **Adapt the level of subsidies to end users investment capacities** by providing higher subsidies to poor and disadvantaged groups.
- **Decrease the level of subsidies as scaling-up occurs** in order to encourage a market- based diffusion of the innovation (i.e. subsidies higher in the demonstration than in the large-scale deployment phase).
- **Fully or highly subsidized projects are counterproductive and difficult to replicate.** Indeed, once people are used to pay a certain price for a good or a service, they or other people will not easily accept to pay more for the same good later. In addition, if users are not strongly involved in the project, they will not adopt the innovation, as people tend not to value services or goods that have been provided for free and will not invest in operation and maintenance.
- When the project implies construction works that last several weeks, **subsidies can be paid in several steps.**
- **Subsidies are not necessarily paid to the end-users.** For example, they can be paid directly to the construction companies that will reflect it in their prices.
- **Assess the opportunities to develop innovative incentive mechanisms** such as material purchasing by batch, tax exemption, partnership with providers, etc.

Subsidy scheme as a support for strategic orientation

Box 20

Passive Solar Housing (GERES, India)	Biogas Support Programme (Nepal)
In Ladakh, most population knows the importance of large windows to benefit from passive solar energy. But almost nobody is aware about the insulation advantages and principles. Thus, GERES took the decision to subsidize the straw even if it is easily available locally and can be provided by the users as contribution in kind. By opposition, glazing is expensive and it could have been relevant to subsidize it. However, as people are used to purchase glazing and they see it as a relevant investment, the focus has been on subsidies for insulation.	In Nepal, the BSP has made the strategic choice to draw-up the subsidy scheme in order to foster the installation of the most appropriate smaller plant size by farmers. The subsidy for the smaller size systems (2, 4 and 6 m3) is higher than for the 8 m3 plants. Plants larger than 8m3 were deemed to be too large for household uses and only affordable for wealthy farmers, and therefore removed from the subsidy schemes. In addition, subsidy schemes provide the opportunity to enforce strong quality control measures. In order to receive the subsidy payments, biogas construction companies are required to certify that they met the quality standards and commit to deliver a 2-years after-sale service.
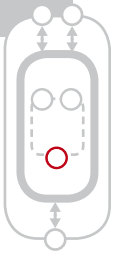
Loans

Even if an innovation is subsidised, it may be a necessary but not sufficient measure to make the innovation affordable to the target group because the investment cost remains high. Thus, numerous projects have set-up loan based financial incentives ranging from commercial loans with private banks to free interest loans and microcredit. The type of loans proposed by the project depends of the nature of the innovation and of the strategic choices made to promote the innovation while ensuring sustainability. For example, the Energy Efficient Housing project (UNDP Mongolia) postulates that it is necessary to offer normal commercial loans for the financing of energy efficient buildings *(i.e. with market interest rates and loan duration periods)* to avoid undermining the development of a healthy commercial mortgage market and to ensure sustainability after the end of the project. By opposition, other projects would rather prefer to develop free interest rate to favour the diffusion of the innovation.

Local context and culture are also essential while design the financial incentive strategy. For example, in Northern China, there is no tradition of loans or mortgages. Farmers prefer to save money and built their house when they have sufficient savings, or to borrow money from relatives or neighbours rather than to go for a commercial loan

But in most cases, the high interest rates are cost prohibitive especially in the case of micro-credit. **Thus, the intervention of the government or donor agencies to cut-down the interest rate may be a relevant action to support the mainstreaming of an innovation** *(cf. Box 21)*.

Biogas Credit Fund
(BSP –Nepal)

Box 21

The biogas sector has a long tradition of credit support. In 1975, the GoN was providing for the first time interest-free loans for biogas users. Later, within the Biogas Support Programme (BSP), a Biogas Credit Fund has been set up with Euro 2.5 million from the KfW. The fund provides loans with an interest rate of 6% to MFIs that are further on-lent to farmers at 14% to construct biogas plants. So far, data shows that micro-credit has played a critical role in making biogas plants affordable for the poor, and around 35% of users use a loan, mainly from MFIs, to construct biogas plants. BSP works with Grameen Bank and other MFIs to extend loans of around USD 200 per biogas plant. In 2007, this system benefited around 180 MFIs, which are mainly Multipurpose or Saving & Credits Cooperatives. In addition, these MFIs also received technical support form AEPC as well as from the National Cooperative Federation of Nepal.

Experience and literature [21] tends to demonstrates that key ingredients to make micro-credit initiatives successful require:

- **Delegating micro-credit services to institutions that have existing comparative advantages** in providing financial services to poor such as MFI.
- **Building capacities of MFIs** on basic technical issues related to the innovation, as well as on risk assessment regarding the specificities of the innovation (e.g. develop specific forms to explain MFI the principle of the innovation, its advantages and benefits, the cost of investment, information related to operation and maintenance costs and requirements)
- **Developing certification mechanisms or other tools to assess the viability and quality of the installation/service that is to be financed**
- **Developing technical advocacy to MFI and banks for portfolio review**
- **Creating a shared risk account between banks, MFIs and government in order to secure the loans**[22], or developing other guarantee mechanisms such as group loans or group guarantee schemes to reduce transactions costs.
- **Providing refinancing facility to the MFIs** *(cf. Box 21)* while being careful to not making the MFI reliant on one specific kind of loan (MFI loans portfolio need to be diversified to guarantee sustainability).
- **Establishing functional linkages between MFIs and the private companies.**
- **Involving NGOs to mediate banks and MFIs credits** and assist in functions like identification of beneficiaries, conducting credit checks, mediating for loans, etc.

21. *"Toward an "energy Plus" approach for the poor: A review of good practices and lessons learned from Asia and Pacific"* UNDP – APRC, 2012 - http://asia-pacific.undp.org /practices/environment/ Publications/ EnergyAccessReports.html

22. More information can be find out in the case studies Straw-bale Building (UNDP, Mongolia) included in the attached CD and can be download on the website: www.saesup.org
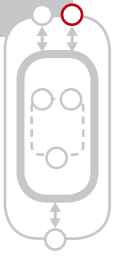
5 / Funding mechanisms to support the Scaling-up strategy

In addition to financial resources needed for subsidies and low interest loans, significant budgets are needed to finance the implementation of the scaling up project and especially all the soft activities *(e.g. promotion activities, trainings, R&D, etc)*. As funds are generally limited compared to the tremendous efforts needed to reach the scale, it is essential to:

- Go for innovative and diversified funding sources and mechanisms
- Assess the efficient use of the resources for each activity.
  It generally implies to go for performance-based management systems.

As scaling up occurs, it is generally necessary to restructure both activities and institutional set-up in order to make them more cost-effectives. For example, the trainings that were provided by the implementing organisation itself in the beginning will probably need to be externalised in order to make this activity more sustainable and cost-effective.

🔑 Key questions

1. What are the main budget lines of the scaling-up strategy?
2. What are the available financing resources?
3. How can they been secured on the long term (e.g. by introducing it in the government policy framework or based on self-financing mechanisms)?
4. How can project expenses be more efficiently organised?

Long Term Donors' Commitment

One of the main factors of success of scaling-up project is based on the long-term reliability of funding resources, as well as the continuity of this funding. Experience clearly illustrates that discontinuity of funds *(e.g. "stop-and-go" effects)* leads to significant negative impacts on the sustainable development of an innovation. For example, when subsidies are suddenly stopped, the demand dramatically reduces leading to the destabilization of the private sector whose strengthening took several years.

The case of the BSP project in Nepal is instructive in illustrating the importance of long-term donor's commitment. The continuous support of DGIS (that started in 1992), later joined by the KfW and the Government of Nepal has definitively been one of the main factors that led to the smooth and sustainable development of biogas sector. However, international donors' commitment is not sufficient. **Government's commitment is essential both in terms of political and financial support to guarantee the sustainable scaling-up of an innovation,** *(cf. p. 30)* and may progressively replace international cooperation funds so as to guarantee the success of the "exit strategy".

Carbon Market

Carbon offset markets exist both under compliance schemes *(e.g. Clean Development Mechanisms (CDM) and the European Union's Emissions Trading Scheme)* and as voluntary programs. These instruments designed to mitigate climate change while encouraging the transfer of low-carbon technology to developing countries is potentially a good way to finance sustainable buildings and energy projects. However many barriers remain to be overcome.

Despite the fact that building energy related use (for construction, lighting, heating/cooling and cooking) is the biggest source of GHG emissions in developing countries, very few CDM projects have been emerging in this sector so far due to numerous reasons:

- **Difficulties related to methodological issues:** more than 40% of Energy efficiency projects have been rejected for this reason and the projects that succeed receive on average only 36% of the full amount of credits estimated in the Project Design Document [23].

- Sustainable buildings and energy projects generally deal with a multitude of households or buildings *(i.e. a large number of small scale interventions)*. Assessing real emission savings implies **complex and comprehensive methodologies and monitoring requirements** to control all relevant parameters that impact carbon credit generation. This is especially true in rural area where population density is very low. Up to now, best practices related to CDM projects for energy efficiency in households have been achieved in high density place such as the project in Kuyasa slum that enabled the methodology of "Suppressed demand" and now paves the way for scaling-up energy-efficient housing [24].

- Carbon trade and especially CDM imply a very **long and complex administrative process** as well as **high transaction costs** that penalize small-scale project since some of these costs are independent of scale [25].

- Income from carbon credits **are unreliable and delayed.**

CDM: A Promising but Hazardous Path

Box 22

Biogas Support Programme started working on CDM in 2001. **BSP became the first CDM project in Nepal with registration of two CDM projects** in 2005: 19,396 plants constructed under the Phase IV have been registered with and approved by the CDM Executive Board (EB). An Emission Reduction Purchase Agreement (ERPA) for the two projects has been signed with the World Bank for trading of the Emission Reductions from the two projects for the first seven years starting 2004/05 as the first crediting year. The negotiated rate, in the final agreement signed in 2006, was 7 US$ per ton of carbon for Certified Emission Reduction (CER). Initially, **it was estimated that each biogas plant will save about 7.4 Tons CO2eq,** but the rate has been capped at 4.99 tons per year per system due to limitations of a Small Scale Methodology *(i.e. Switch from Non-Renewable Biomass to Renewable Energy Sources)*, generating an annual carbon revenue (net of project development and verification expenses) of about 360,000 US$.

Annual Emission Reduction Report and Community Benefit Report have been sent regularly. But the verification of first round of reports only took place in January 2007. The **EB also took long time to deliberate** and finally informed in August 2008 that the monitoring was not acceptable, an appeal was made in October 2008, which took 6 months to be accepted. **As of 2011, only the payment for first crediting periods (for the period ending in 2009) has been made.**

Meanwhile, the **EB rejected the existing methodology,** mainly for two reasons: 1) saving of non-sustainable firewood is interpreted as avoided deforestation, a category not included in the CDM, and 2) there are issues of possible biogas leakage, that are difficult to monitor. The Nepal Delegation in the 2006 CoP/MoP in Nairobi (Kenya) put up a strong lobbying and arguments. The CDM EB further improved the methodology, and sent for concurrence of the Bali CoP/MoP in 2007. The **new methodology** *(i.e. Switch from Non-Renewable Biomass for Thermal Applications by the User)* was approved in January 2008, but savings obtain via this methodology are barely reaching **2.5 tons of CO_2 eq. per plant per year.**

Subsequently, BSP-N, AEPC and KfW have been working **to develop new biogas CDM project based on a programmatic approach.** A Programme of Activities Design Document (PoA-DD) is likely to be registered soon with the CDM EB for the plants built after June 2007. Albeit the upfront cost for PoA is higher, this approach has the advantage to reduce transaction costs as well as future hassles: once it is approved, all the biogas projects included in the programme will be eligible for the next 28 years.

The **Voluntary Emission Reduction (VER) market is another mechanism for getting carbon credits.** BSP-Nepal and AEPC are working with WWF-Nepal to develop a new biogas project called Gold Standard Biogas VER Project (GSP) for conservation of buffer zone areas. Those carbon credits could be sold on the voluntary market. The Gold Standard ER methodology leads to a net annual emission reduction of 4 tons CO_2 eq. per plant.

Some questions should be addressed before engaging in the long and complex carbon trade pathway:

- Estimate GHG emissions that will be saved by the project at mid-term. Even with specific program for small case project, Certified Emissions Reduction (CER) should be at least superior to 25,000 t.eq.CO_2/year for the MDG Carbon facility, and to 10,000 t.eq.CO_2/year for the Volunteer Emission Reduction of the Gold Standard, to recover the transaction fees.

- Go for programmatic approach (PoA) which has the advantage of integrating potential future projects as long as they are within the defined programme boundaries.

- Go for high quality certification such as Gold Standard [26].

23. Carbon revenues & Markets,I. Puhl, South Pole - International Workshop on Domestic Biogas in KTM, Nov. 2009

24. See the website of the project http://www.kuyasacdm.co.za/ and The Potentials of, and Barriers Facing, Demand-side Energy Efficiency Projects in Low-income Households under the Clean Development Mechanism, and the Way Forward through Programmatic CDM , Nathaniel Manning, Brown University, 2008

25. Guides available notably via http://cd4cdm.org/Guidebooks.htm

26. The Gold Standard is the premium certification standard for carbon credits (both compliance and voluntary offset markets). They have developed a set of innovative tools to lower entry barriers and foster micro and small scale projects, notably mini hydro turbines, cookstoves, biodigesters. More on http://www.cdmgoldstandard.org

6 / Institutional set-up, coordination and networking

A scaling-up program should not be created from scratch.
In order to be efficient and cost-effective it needs to rely on existing organisations and institutions (ministries, local authorities, NGOs, cooperatives, federations, etc). To do so, a diagnostic of existing institutions and of relevant stakeholders and networks may be drawn as a starting point of the scaling-up strategy. Once the map of actors has been defined (cf. STEP 1- §4), synergies between actors, partnerships and collaboration opportunities may be identified
- if possible with a holistic and participatory approach.

Key questions

1. Who are the institutions and private organisations that can be involved in the project? And what are the prevalent relations/interactions between these "actors"? (Actor mapping)

2. What would be the best institutional set-up that leads to an efficient use of resources and competencies to scale-up the model?

3. What specific networking strategies and/or innovative partnerships could be developed in order to scale-up the model?

4. How the project can proceed to foster a common culture & vision among the stakeholders?

5. What would be the strategy and tools to coordinate the different stakeholders? (Joint planning and actions, specific logistic management systems, etc)

6. How can a participatory process be set-up during the implementation of the scaling up project?

Institutional Set-Up

Stakeholders involved in the project are generally numerous and may change during the different phases of the project. It is essential to carefully design the project institutional set-up in order to guarantee that each activity is carried out as efficiently as possible *(i.e. by the organizations with the needed resources, competencies and legitimacy)*.

TOOL 9
gives an example
of how the institutional
set-up could be defined.
It is worth using this
table to compare
different scenarios.

Institutional Set-Up of Biogas
Support Programme (Phase IV) - Nepal

Box 23

Historically, SNV was the implementing agency of the program. At the end of the phase III, the question "how to manage the project without SNV?" was raised as a first step toward the independence of the biogas sector in Nepal. Several existing organisations were potential candidates to become the new implementing agency. However, it was decided to create a new autonomous body with legal recognition of its own. BSP-N (Biogas Sector Partnership – Nepal) was set-up as an independent national NGO in 2003. Its main objective, as implementing agency, is to facilitate, promote and regulate the development of the biogas sector.

NBPA (Nepal Biogas Promotion Association) is an umbrella organisation of the biogas companies. Its mission is to promote biogas benefits, train and monitor masons and supervisors of the Biogas Construction Companies (BCCs), coordinate the BCCs and regulate the sector (via the code of conduct) as well as offer promotion support to the BCCs and arrange and supply biogas systems materials and appliances.

AEPC (Alternative Energy Promotion Centre) is responsible of the programme on behalf of the government to supervise the BSP, project, to monitor i implementation as well as to develop the micro-credit as a viable scaling-up tool for the biogas.

The following frame presents the institutional set-up during the fourth phase of BSP.
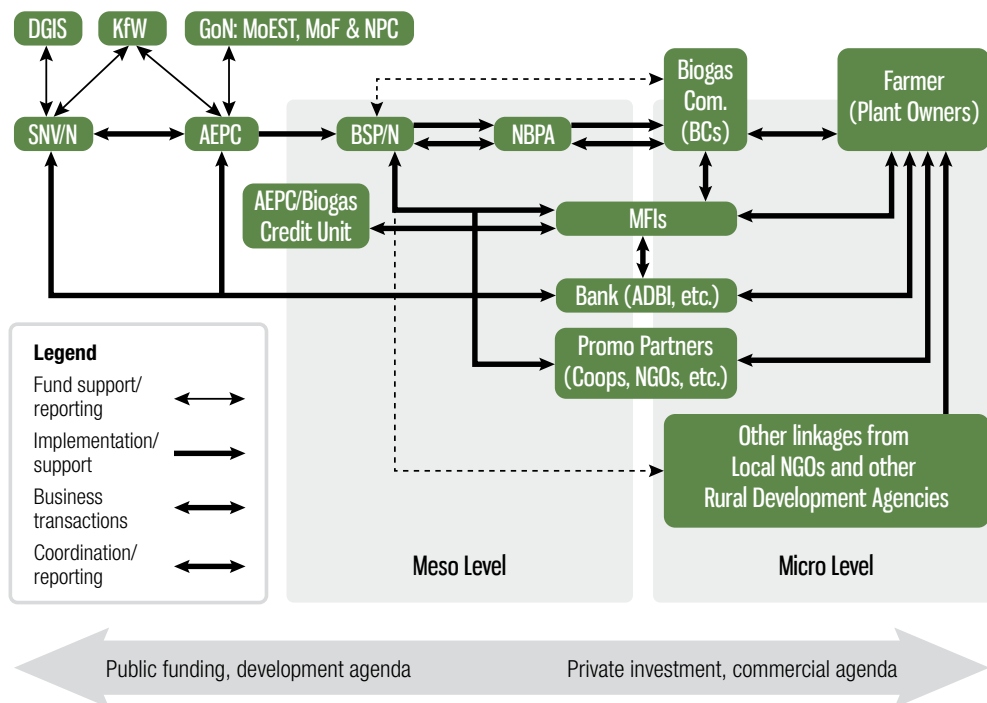
(Source: Building Viable Domestic Biogas Programmes, SNV - 2009)

This institutional set-up is said to be well established and efficient for the development of the biogas sector for the fourth phase. Nevertheless, at the end of this phase, that coincide also with the end of DGIS financial support, the institutional set-up needs to be reorganised by taking into account strengths and weaknesses of each organisation in order to implement the next phase even more efficiently. The reorganisation of the activities needs to be done on an efficiency-based approach. Most stakeholders agree that each component has to be assessed independently in order to determine which organisation is the most relevant to implement each component as efficiently as possible while aiming for a scenario where most components are run by the private sector.

Step 2

Design the
Scaling-up Strategy

47
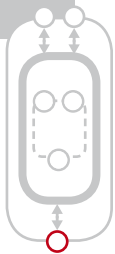
Relation with government

As far as scaling-up is concerned, it is essential, in most cases, to strongly associate the national and local authorities to the project. In the Step 2- §1, we emphasized the role of the authorities to provide more legitimacy to the innovation and to support its scaling up by creating a favourable environment (regulation, fiscal incentives, land policies, subsidies, etc). **The setting-up of a specific, independent and operational governmental department or agency at the national or regional level can also be a powerful tool for the mainstreaming of the model.** The example of AEPC (Alternative Energy Promotion Centre) and DEES (District Energy Efficiency Sections) in Nepal *(Cf. Step 2§1 p.26)* and LREDA (Ladakh Renewable Energy Development Agency) in Ladakh are good examples of what can be achieved [27]. Box 24 illustrates how the local government has supported the development of straw-bale houses by setting up local Project Management Offices.

Project management by the local authorities – China

Box 24

ADRA and its partners attach special importance to working closely with local governments about planning, design, and implementation of buildings projects. The project is only active in communities that have serious housing needs and have expressed interest. When both conditions are fulfilled, the local government is invited to visit an existing community with straw-bale houses to interview house-owners and members of the Project Management Office (PMO).

In order to participate in the project, local communities must commit themselves to: 1) providing matching funds, 2) establishing, supporting, and staffing a local PMO, 3) recruiting and sending the PMO staff, a local government leader, at least five skilled local builders, and a building designer to the technical training, 4) selecting the recipients for the new housing, 5) overseeing the construction teams and inspecting quality during construction, and 6) managing the financial aspects of the project with complete transparency.

The PMO is a formal group composed of county, township and/or community level officers generally from the Bureau of Construction which objective is to inform households and professionals, provide trainings, manage the subsidies and monitor the construction process. Members of the PMO are chosen by local authorities and have to guarantee they will have sufficient allocated time to comply with their new responsibilities. A contract is signed between ADRA and local authorities to define the terms of reference of the work that will be carried out by the PMO.

Networks and Partnerships

Networking and partnerships are essential for scaling-up since by creating synergies between actors the resulting strength of the network is bigger than the sum of individual strengths. However, it is time consuming to set-up successful partnerships and networks since it **involves creating a common vision, joint planning and actions and, in some cases, common management systems.** But once they have been set-up, network and partnership can save significant time and money while reinforcing the capacities of the stakeholders.

Partnerships typologies are varied and range from Public-Private Partnerships to informal networks. In addition, relations between stakeholders can be defined in specific contracts, memorandums of understanding or simply be based on oral accords. Even if the differentiation can sometimes be difficult, some partnerships will support influential policy dialogues and mainstreaming of the model *(e.g. alliance building)* while others will mostly lead to replication and knowledge transfer *(e.g. networks)* [28]. Last but not least, it has to be recognized that partnerships also generate complexities and difficulties, such as unequal relationships, especially with regards to the partners holding resources and those that do not.

27. For more information, check AEPC (www.aepc.gov.np) and LREDA (http://ladakhenergy.org) websites.

28. Scaling-up Strategies for Research in Natural Resources Management, S. Gündel, J. Hancock, S. Anderson - Natural Resources Institute, 2003

Successful networks and Public-Private Partnership

Box 25

Passive Solar Housing (PSH) project (GERES) - India

NGOs Network

In the framework of the PSH project, GERES has set-up a network with five local NGOs (LEDeG, LEHO, LNP, SECMOL and Ecosphere). Each NGO plays a role as either resource or proximity NGO or both. Resource NGOs act as technical advisors to proximity NGOs in their specific fields of knowledge (elaborating methodology, coordinating meetings, organising workshops and trainings, handicrafts component, technical specificities, etc.). Proximity NGOs are responsible for project implementation in their respective area of intervention. In addition, NGOs are organizing and participating in workshops (general and technical review), M&E committees and coordination meetings during which all the issues related to project implementation and strategies are discussed and decisions taken.

Grassroot Level Network (GRN)

Grassroot level networks have been set-up at village or cluster level, to play an important role in ensuring grassroots participation in the project (awareness raising, selection of beneficiary families) as well as to act as a pressure group to advocate policy for PSH development to district authorities with proximity NGOs assistance. They are composed of proximity NGOs, village representatives, beneficiary families and representatives of the private sector (masons, carpenters, etc.).

Policy Network (Steering Committee) that includes political leaders, local councillors and NGOs representatives have been set up with the objective to convince decision-makers of the relevance of these techniques in the local context and the necessity to develop favourable policies and institutional frameworks to mainstream passive solar design and energy-efficiency techniques.

Biogas Support Program in Nepal

One of the factors of success of the Biogas Support Programme to scale-up biogas plants in Nepal has been to build a successful Public-Private Partnership (PPP). Private biogas construction companies and craftsmen fabricate the equipment and provide quality services on construction and after-sales services. Nepal Biogas Promotion Association (NBPA) is leading the following activities: skill building of the companies, supporting certification process of biogas companies, promotion activities and development of a code of conduct. Monitoring, qualification and grading of companies, and quality control as well as partners' coordination and R&D activities are carried out by the NGO BSP-Nepal. Micro credits are provided by cooperatives with the technical support of BSP-Nepal and the financial contribution of the government though the Biogas Credit fund. Last but not least, the Government of Nepal is creating an enabling environment (financial contribution, pro-active policies and tax exemption). The following graph sums-up the synergies created by this PPP:
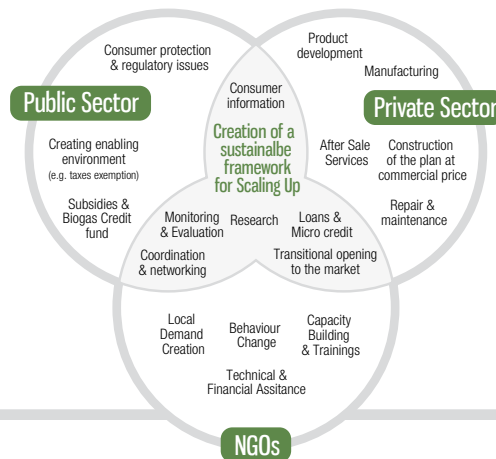
Cooperation with other projects

NGO's, institutions, and international, national or local agencies are usually carrying out their project with very few coordination and consultation with other similar projects or programs. Despite this being the case, when coordination does occur with other projects, it is rarely effective or done in an efficient way, leading to double efforts and lack of capitalisation on lessons learnt by others. For example, the projects lead by ADRA in China and the UNDP in Mongolia both focus on the development of energy efficient houses using straw-bale construction techniques in similar contexts, but there is no cooperation between them. Building codes developed by the UNDP and fire resistance tests are totally unknown to their Chinese counterparts. This illustrates the lack of vision and time to study similar experiences and favour good practices transfers. Projects strategies should identify resources and time to undertake this kind of activities or even create bridges between initiatives (e.g. sharing platform, forums on internet, regional exposure visits and seminars, best practices workshops, etc).

Holistic/transversal approach

In order to further scale-up energy efficient and/or renewable energy projects, it may be essential to **develop holistic approach by setting-up partnerships and networks with institutions working on different sectors.** For example, a project promoting biogas system may find relevant to work in close collaboration with health programmes. Once health programs' decision makers are convinced of the relevance of connecting latrines to a biogas system, they will most probably support the dissemination of biogas system as an adequate solution to decrease health problem within communities and may even provide some funds.

Even if the development of transversal projects looks very attractive and may be a necessary step to further scale-up project's activities and impacts, the implementation of such initiatives remains tricky and many obstacles persist (e.g. joint planning, budget sharing, communication, etc.).
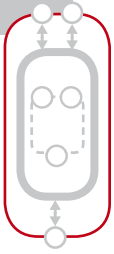
7 / Scaling Up Plan

Once the scaling-up strategy has been defined, related activities will need to be planned, budgeted and scheduled and the roles and responsibilities of each stakeholder clarified and detailed.

All the produced reflection and information may be summarized in a relatively brief document (perhaps ten to twenty pages plus appendices): the Scaling-up plan.

Target audiences for this document are both internal and external (project stakeholders, decision makers, governmental agencies, and potential project funders). It should therefore be written in an appropriate manner to provide adequate information for these different potential readers.

This scaling up plan will be based on the shared vision. It will be the roadmap of the implementing organisation by detailing the adequate levers of actions, the time schedule and budgets.

Note : Monitoring and Evaluation (M&E) issues, detailed in the next chapter (Step 3), are essential for the successful implementation of a scaling-up project. It is strongly advised to include M&E activities as a part of the scaling up strategy, and therefore include the activities, human resources and budget related to M&E in the Scaling-up Plan.

Step **3**

Implement the
Scaling-up Strategy

Once the strategy has been designed, its implementation can start based on the objectives and activities defined in scaling-up plan, paying a special attention to the following points:

• A comprehensive logistic management system has to be set up in order to successfully deal with all the challenges of a scaling up project

• A careful attention has to be paid to anticipate the evolution of the implementing organisation in terms of human resources management, competencies and financial resources.

• A comprehensive monitoring and evaluation system to assess the evolution of both the model and the context so as to constantly adjust the strategy. The M&E system can be considered as the seventh levers of the scaling-up strategy.

1 / Create a field-tested logistic management system

Scaling-up is a form of systemic change. Like any systemic change, it involves actions by many stakeholders – legislators, national leaders, activists, service providers, and donors, to name but a few. It involves reaching agreements and turning those agreements into actions, as well as an important work of coordination. In addition, each scaling-up programme will face the challenge to train thousands of artisans and people, certify thousand of companies or independent workers, organize thousands of community meetings or awareness raising campaigns and monitor the quality of thousands systems or buildings.

Thus, it is essential to assess the needs in terms of organization, logistic, management, monitoring and evaluation. A very good internal organisation based on a logistics management system is required.

Binswanger and Azya strongly recommend that this **logistic management system would be field-tested and summed up in a scaling–up manual**[29]. The logistics management system may contain harmonized documentation and manuals to be used by all partners involved in implementation of awareness raising and training activities. **This manual may assist the implementing organisation in systematizing all the tasks necessary to bring the model to scale.** Some of the main components that may be incorporated in the "scaling-up manual" and implemented during the project are detailed hereafter[30]:

1. The promotion and awareness raising strategy, including:
   - Understand best way/medium to make promotion *(cf. Annexe 5)*;
   - The management system to organise community meetings and/or other elements of the awareness raising campaign;
   - The communication and awareness-raising posters booklets and/or manuals required for scaling up;
   - Contents of other programmes to be broadcasted through other media, if relevant;
   - The partnership strategy with other organisations for promotion activities.

2. Capacity strengthening strategy:
   - The management system aimed at training, strengthening and/or accrediting/certifying construction companies (e.g. Biogas construction companies, etc.) or individual artisans (masons, carpenters, etc.);
   - The processes for the recruitment and training of the training teams;
   - The training manuals, forms and other tools required for scaling up

3. The management systems for contracting, procurement and distribution of goods and services for the program.

4. The management systems for control and monitoring of subsidies, loans or other financial support payment.

5. The knowledge management and dissemination strategy.

6. The logical framework and timetable of the scaling up process.

7. The templates for all the project preparation and monitoring documents, including those related to M&E, and performance based contracts to be used in the scaling up effort.

8. The strategy to identify or select beneficiaries, if relevant, and the management of contracting framework to provide intended support.

2 / Competency building of implementing and partner organisations

As scaling-up proceeds, implementing organisations and project partners perpetually need to mobilise new human resources and develop new competencies to match the news skills required and the evolution of their roles and responsibilities. For example, the number of training sessions to be organised will significantly increase as scaling up proceeds. In a first phase, the implementing organisation will probably need to increase its staff. In a second phase, it may be necessary to externalise the trainings' organisation to training providers or to set-up a new organisation. Thus the project team will need to shift form training skills to competencies related to training of trainers or to support the set-up of training providers companies *(i.e. business plan, recruiting, etc.).*

For this reason, it is essential that to draw-up a plan of continuous training coupled with a monitoring mechanism to identify training needs. An adequate human resource management of both implementing and partner organisations is crucial to effective scaling-up.

In addition, knowing that most projects are funded and supported by international cooperation agencies, scaling-up strategy must be designed with **the objective to make local organisations and partners autonomous in order to favour the withdrawal of the international cooperation before by the end of the programme ("exit-strategy").**

Competency building for local NGO (PSH, India)

Box 26

One component of the Passive Solar Housing (GERES) in Northern India focuses on strengthening the abilities of local partner NGOs. Two kinds of actions have been implemented:

- **Internal capacity building** through the NGOs network. Resource NGOs have been chosen according to their competencies with the objective to train local NGOs who implement the project, on their field of expertise. For example, LEDeG which has had previous experience with Trombe Wall techniques has been appointed as resource NGO for this technology while SECMOL is specialized in education issues and is the resource NGO for trainings and awareness raising activities (media, etc.)

- **External capacity building.** An institutional capacity assessment of proximity NGOs has been carried out at the beginning of the project. Then GERES as well as Indian and international experts have scheduled trainings to reinforce the NGOs competencies *(e.g. technical skills, internal and external project management competences, business and fund rising skills and basic knowledge regarding marketing, training of trainers, human resource planning, etc.)*

Dissemination & capitalization of experience

Last but not least, **an efficient system of information archiving, experience capitalisation and knowledge transfer has to be set-up.** This is very useful and relevant for long-term projects (such as scaling up projects) that usually suffer from frequent staff turnover. The experience capitalised will therefore be essential to better train new recruits and not loose previous experience and lesson learnt.

In addition, the **capitalized experience and lessons learnt will be significant inputs for successors or similar projects.** However, in many organisations internal experience capitalisation is very weak since it is a quite time consuming task that required a strict knowledge management mechanism.

3 / Project Monitoring and Evaluation (M&E)

As scaling-up is a long-term process, the project environment is perpetually evolving as scaling-up proceeds. Significant changes can appear in the social and cultural environment, new laws or regulations will most probably emerge, the economical environment may evolve as well as other elements such as demographic trends and climate to name but a few. Thus, a comprehensive M&E system is essential to guarantee the efficiency of any scaling-up project. It may provide project managers with data on project activities and effectiveness, as well as with information about the evolution of the context. The information is crucial to manage the project and to adjust the strategy as scaling-up proceeds. In addition, M&E data are useful to give feedback to the public, users and decision-makers (policy advocacy) on the project outcomes as well as to plan future resource needs.

Last but not least, it is advisable to set-up a comprehensive M&E system based on a participative approach or at least to identify systematic and effective way to collect the feedbacks from project stakeholders to better anticipate and assess both the evolutions of the project and environmental changes that can affect it.

⚷ Key questions

1. What are the key indicators that need to be monitored? Are these indicators "SMART"?
2. What are the monitoring strategy and objectives (tracking the performances, momentum maintaining, adaptation of the scaling up strategy, etc...)?
3. Does this strategy enable to assess the impacts of the scaling up strategy and to make it evolve as scaling-up progresses?
4. Would it be relevant to set-up a monitoring cell (composed of project stakeholders) to follow project evolutions?
5. How is information fed back to the public and decision makers (communication & dissemination)?
6. What kind of evaluation is necessary (internal, external, etc.) and with which frequency (annual, mid-term, final, etc.)?

Monitoring and Evaluation requires SMART indicators

Project outcomes should be measurable using indicators. It is important that the formulation of the outcome statement takes into account the need to measure progress for monitoring and evaluation of the action. The indicators for M&E should therefore be "SMART" as detailed below.

Box 27

SMART Indicators

S	Specific	Impacts and outcomes and outputs must have a precise meaning and describe a specific future condition
M	Measurable	Results, whether quantitative or qualitative, must have measurable indicators, making it possible to assess whether they were achieved or not
A	Achievable	Results must be within the capacity of the partners to achieve
R	Relevant	Results must make a contribution to selected priorities of the national development framework
T	Time-bound	Results are never open-ended— there is an expected date of accomplishment

Project monitoring

The monitoring systems have to be set-up in order to provide project coordinators and decisions makers with the needed information to ensure the good follow-up of planned activities and to be in capacity to adapt the strategy as scaling-up proceeds. To do so, a Monitoring & Evaluation Cell that includes as much as possible all project partners should be set-up.

Box 28

Monitoring & Evaluation cell (GERES, India)

To ensure sound follow-up and monitoring of the Passive Solar Housing project activities and impacts, **the GERES has established a Monitoring & Evaluation cell (MEC).**

The cell is composed of the local NGOs implementing the project on the field and of the GERES project coordinators and aims at following activities progress and achievements, updating objectively verifiable indicators, analysing difficulties and proposing solutions. Members of the cell are meeting on a quarterly basis on the occasion of follow-up and annual review workshops. The MEC is an **efficient tool to manage the project, identify success, weakness and delays and to undertake corrective actions on time.**

In addition, MEC are organising specific sessions where local **NGOs directors receive updates on the project progress and take part in strategic decisions regarding project implementation and the adjustment of the strategy.**

Construction Quality Follow-up and After Sale Services

As described in the Step2-2, the quality of a product/service directly influences the satisfaction of the users and represents an important factor of success for the implementation of a scaling-up strategy. **Thus, it is essential to set-up a monitoring system that guarantees the products/services to be of the required quality.** For energy-efficient buildings related project, monitoring mechanisms may ideally act at three levels: (1) construction follow-up, (2) final quality assessment while delivering the buildings, (3) After Sale Service (ASS).

For renewable energy project, similar approach may be promoted in order to guarantee the quality of the product, of the installation and of the ASS. This follow-up could be done either by an independent company or artisan *(e.g. local masons that are trained to monitor the construction done by other masons)*, by the implementing organisation or by a third party.

For example, BSP-Nepal has developed quality standards that are certified ISO 9001-2000 in order to guarantee the quality of the biogas plant constructed by the biogas construction companies, as well as a strong and transparent management system and subsidy administration. BSP-Nepal also introduced a two years After Sale Service to provide free maintenance. The quality of this service is strictly monitored as described in Box 29.

Quality and After Sale Service Monitoring

Box 29

For each biogas plant constructed, the Biogas Construction Company (BCC) has to submit a so-called completion report to BSP-Nepal in order to receive the matching subsidy after verification of the information sent. This report contains: the name of the family with their photo and the photo of the plant under construction and completed, the name of the village with GPS localization, the "subsidy voucher" signed by the farmer (that confirms he received the subsidy from the BCC) and other details related to the biogas plant.

In addition, the BCC has to provide the user with a two-year guarantee (After Sale Service) with free maintenance. During this period, the BCC has to go and check the plant at least twice. This represents an additional incentive for the BCC to construct high-quality plants.

Monitoring System

In order to ensure the quality of the biogas plant a strong quality control and monitoring procedure has been developed. The reliability of this system has been reinforced with the participation of the project to the CDM. Each year, 10% of the plants are monitored with the following distribution:

- 5% of the new plants (1st year): quality control
- 2.5% of the plants constructed one year ago (2nd year): After Sale Service (ASS) control
- 2.5% of the plants constructed two years ago (3rd year): ASS control

This monitoring is done with a sampling method of 10% of the plants installed by each company, allowing for all companies to be monitored equally. Additionally, an external consultant carries out, each year, a Biogas User Survey (BUS). This survey is based on another sample of 5% of the plants.

The actual quality control system is effective but intrinsically expensive. Amongst many possible options to reduce monitoring system costs, NBPA is developing an "Internal Quality Control" (IQC). The main idea is that quality monitoring of the plants has to be performed by the companies themselves (by filling in a dedicated form) and that they have to ensure the quality of the plants as well as the ASS. For each plant, BCCs have to send 3 reports: one after the plant completion and two ASS reports (one per year). By this way, monitoring costs may be reduced by decreasing the sample of plants to be monitored (the monitoring will also focus on the accuracy of the reports delivered by the BCCs).

The combination of good installations, affordable finance, support and quality checking have led to very high success rates for biogas plants in Nepal since nearly 92% of the plants installed under the BSP programme are still in operation.

Energy performance monitoring

While working with energy efficient buildings or renewable energy it is also essential to monitor the real performance of the construction/system. In general, in depth studies have been done during the pilot stage to assess the efficiency of the promoted model. Nevertheless, the performance of the model during the scaling-up may be lower since follow-up is lesser than during pilot stages. For example, during the implementation stage of an energy efficient house, the design performance may be degraded because the insulation thickness is not respected or because of the creation of thermal bridges. Thus, **average performance of the model needs to be assessed to ensure that quality is satisfactory.**

Energy efficiency projects need to be very careful while monitoring energy performances. In many demonstration projects, it is carried out just after the completion of the houses mainly due to time schedule obligations. This affects significantly the results since the building is not "dry" and the inhabitants need to adapt their behaviour to the new buildings, to name but a few possible cases.

Evaluation

In general, intermediate and final evaluations are carried out for most of the projects. Midterm evaluations mostly aim at providing an external opinion regarding action progress, results achievements and fulfilment of objectives and to redefine the project strategy. Conclusions and recommendations of these evaluations form a basis on which to conduct further terms of the action.

At the end of the action, the final evaluation aims at assessing whether the action has responded to planned objectives and expected impacts or not, whether the sustainability is assured and multiplier effects are achieved. Besides, final evaluations are useful to design future project and to give guidance to decision makers, and should be strongly related to experience capitalisation and dissemination activities.

For both mid-term and final evaluations, **it is essential to have a good baseline study** in order to assess project impacts. This is a critical point that need a special attention at the beginning of the project but that is generally underestimated for several reasons: time consuming, willingness to start the actions, difficulty in identifying the SMART and relevant indicators to construct the baseline, etc.

Exit strategy: the last step toward a sustainable market

Once the scaling up project has been implemented for several years, the innovation may have reached a significant scale to be able to keep developing itself sustainably.

However, the project should not stop from one day to the other. It is primordial that the implementing organisation, take the time to create the necessary condition to allow the innovation to stand on one's own two feet. The worth scenario, would be that the development of the model will stop as soon as the project will stop loosing all benefits, efforts and money that have been invest so far. Thus, the implementing organisation will need to smoothly withdraw its technical and financial support, focusing on strengthening a sustainable and self-reliant market for the model: this is the objective of the exit strategy.

Step 4

Exit strategy: the last
step toward a
sustainable market

The objective of the present manual does not lie in detailing
how to carry out a good "exit strategy".
This issue is complex and must be carefully considered.
Besides, up to now very few projects have achieved the objective
of mainstreaming renewable energy and energy efficiency
related models. Providing guidance for the design of a
comprehensive exit strategy requires a specific manual.

Nevertheless, the following list enumerates a modest and non-exhaustive numbers of issues that would need to be addressed while designing the exit strategy:

- The model must reach a threshold that guarantees that the demand exists by its own and is sustainable. Some studies mention that when an innovation represents 10% of a market it starts influencing it. However, this should be considered on an individual basis.

- A dedicated organisation may be created in order to keep promoting the innovation, strengthening the offer and providing potential users and professionals with the information they are looking for. This could be the objective of a resource centre or a Local Energy Agency.

- There should also be an organisation *(e.g. networks, association, federation, etc)* that is in charge to organise the concerned professionals, create a code of conduct and represent the interests of both the innovation and the professionals *(Cf. Box 30)*.

- It is advisable to set-up and strengthen an independent organisation *(e.g. it can be the same that the precedent or the resource centre)* that will be in charge and guarantee the quality of the product or construction.

- The objective of this exit strategy is to create or strengthen these organisations by ensuring that needed competencies are present and that they rely on a good business model guaranteeing their sustainability, which does not imply that organisations have to rely only on private funds. As these organisations are providing public goods and services, they should receive financial supports form national and/or local authorities.

- The exit strategy may also guarantee that the supply chains are self-sufficient to keep developing themselves in order to address the increasing demand.

- Trainings and capacity building regarding the specific skills needed for the model may have been institutionalised *(i.e. included in existing universities, VET and training providers curriculum)*.

- Advocating and lobbying activities may be also part of the exit strategy in order to guarantee that a favourable legal and/or political environment will allow the sustainable development of the model.

In few words, the exit strategy focuses on creating a sustainable market
for the model that is self-sufficient regarding its development.

As of December 2010, 225,356 biogas plants have been constructed in all 75 districts in Nepal. Around 1.3 million people have directly benefited from the programme. Biogas Support Programme is certainly the most advanced of the 6 cases studies regarding scaling up issues. Step by step the external support (technical and financial) is decreasing, and the capacities of local NGO, professionals and local and national authorities strengthen. The setting-up of the Nepal Biogas Promotion Association (NBPA) has been the first step toward the exit strategy.

History

NBPA (formally NBPG – National Biogas Promotion Group) was created in 1994 as an umbrella organization so as to respond to a real demand of the biogas companies (bottom-up approach). The memberships of NBPA are private companies involved in the biogas sector. NBPG became an association (and changed the previous name to become NBPA) in 2007/08, in a view to broaden out the perspective of the organization. Its main objectives are:

- Advocacy and promotion of the biogas program at micro and meso levels
- Improvement and quality control of the biogas systems
- Importation of some appliances and distribution to biogas companies
- Masons and supervisors trainings and "certification" of the private companies
- Self-regulation of Biogas Construction Companies (BCC) through a "code of conduct" and other appropriated mechanisms.

Besides, NBPA is supported by an advisory board of 15 persons, divided in working groups in charge of the review of the policies, the code of conduct, etc.

Financial Sustainability of the NBPA

At an early stage, NBPA faced common difficulties linked with the institutional set-up of any organization (good management practices, monitoring system, financial management, etc.). These difficulties as well as some weaknesses related to the lack of qualified and trained staff were overcome to improve the efficiency of the structure.

But the financial sustainability of the structure remains a difficulty. Most of the activities are currently funded by BSP Nepal program. Only the management cost remains at the charge of the structure, and is covered by the registration fees paid by the members of the association (BCCs).

At mid or long term, the business model of the association plan to significantly increase the share of the commercial services (memberships, license for each biogas plant built by the companies, trainings, etc.) coupled with a governmental contribution. However, for this to happen, the association must first provide biogas companies with satisfactory services. If companies are satisfied with the range and quality of services offered by the association, they will agree to pay for membership and other fees. Up to now, NBPA has been too small to provide the BCCs with a satisfactory set of services. For this reason, the financial contribution of external donors is still necessary to support the development of the structure to reach the critical size that will enable its financial sustainability.

NBPA a Necessary Organization for the Development of a Sustainable Private Sector

To develop a sustainable private sector, it is very important to have an organization that federates biogas companies to structure the sector and defend their interests. Besides, it was very important for BSP-N and AEPC to have a single interlocutor instead of a multitude of private companies. This has allowed for the improvement of control and regulation of the companies while also including the requirements of the private sector in the legislative environment. The creation of NBPA was born naturally from the need of companies to regroup themselves.

Code of Conduct

A code of conduct (CoC) has been set up upon the request of the BCCs to regulate the sector and to avoid inappropriate behaviour and the development of an unhealthy market. The code of conduct allows maintaining the biogas plants at a fair cost and good quality while avoiding reprehensible behaviour between competitors and facilitating the arbitration of eventual conflicts. The non-respect of the CoC can lead to the radiation from the list of certified biogas companies.

Step 4

Exit strategy: the last
step toward a
sustainable market

KEY

/ Key findings
& recommendations

Scaling-Up needs leadership, vision and values

- **Assess the innovation scalability and maturity,** as well as its strengths, weaknesses and cost-effectiveness compared to alternative models:
    - Check whether the innovation fits the CORRECT attributes (Credible, Observable, Relevant, Relative advantage, Easy to understand and implement Compatible, Testable)
    - Assess the maturity of the innovation since the full potential benefits of an innovation are unlikely to be achieved if it is expanded too early.
    - Collect the information from similar initiatives in other regions/countries to benefit from their experience and results.
- **Elements of context of the project have to be carefully assessed, understood and documented in order to create a shared vision amongst project stakeholders by:**
    - Carry out a comprehensive actor mapping based on an holistic approach
    - Involve as much as possible identified stakeholders in the creation of the vision and definition of the scaling-up strategy using participatory methods
    - Answer the following key questions: WHAT is being scaled up? HOW scaling-up will be achieved? WHO will lead the scaling-up process? WHERE scaling-up will occur?
- **Strong interpersonal communication and group facilitation skills are essential**

Scaling up needs political commitment and enabling legal environment

- **It is essential to inform and advocate relevant decision and policy makers on the innovation's relevance and efficiency** to face the issues these authorities are dealing with (incl. cost-efficiency and comparative advantages on alternative models).
- **Supportive policies** *(e.g. enabling regulatory and legal environment, financial and fiscal incentives, land policies, quantified objectives in multi-years plans, etc)* are a significant advantage for the innovation's scaling-up. It is essential to consider **all existing levers that can foster the innovation with governments and local authorities.**
- In some cases, **the existence of a specific and operational public institution with the adequate budget and human resources as well as with the legitimacy to act independently is a perfect lever for the scaling up.**

Scaling up benefits from a comprehensive promotion strategy

- **Target group identification** is essential. It is not as obvious as one might think and the selection of non-adequate target groups could compromise the change of scale.
    - In many cases, restricting the focused target group **to people in a precarious situation leads to a stigmatisation of both the innovation and its user.**
    - Achieving the twofold goal of **making innovation affordable and desirable to people in a precarious situation and implementing conditions for sustainable scaling** up is challenging. Thus, **starting with an "intermediary target group"** may be an appropriate approach
- **Define a comprehensive communication strategy.** For each key audience that needs to be informed and convinced about the innovation's relevance and comparative advantages, the strategy may detailed the needed information and relevant supports and channels of diffusion.
- **Communication is a two-way information flow** where feedback mechanisms are indispensable.
- **Quality is essential** especially when the innovation is demonstrated for the first time in the given area: Good quality = Satisfaction of the user = Best solution for promotion
- **Demonstration sites:** End-users need to feel and test the innovation
    - Demonstration sites **are usually more effective when they are in the same sector and use the same modalities as expected for the following replications**
    - **Demonstration through "influent people"** whom other community members wish to imitate
    - **Set-up a resource centre.** It is a structural action **to link and strengthen both demand and offer.** It needs to be an acknowledged and legitimized place where potential users and professionals can find the information and competencies they are looking for.

Scaling Up needs competencies building and strengthened supply chains

- Innovations **must be tailored to the socio-economic context and target groups' specificities and fit as much as possible with local practices and competencies** in order to limit the degree of change implied *(i.e. based on local construction techniques)*.

- **Trainings and capacity building may be designed for all key stakeholders** including decision makers, materials providers, constructions companies/artisans, financial institutions and the civil society.
    - **Trainings must preferably be done in partnerships with existing training providers** (public or private) and **training of trainers fostered.**
    - **Monitoring and evaluation of training sessions are essential** to guarantee their quality and keep improving the model as well as to ensure the good understanding of key messages.

- **Capacity building and institutional strengthening of implementation and partner organisations** are primordial to sustain the scaling up process.

- It is a must to integrate **the specific knowledge and know-how related to the innovation in existing schools, universities and vocational training curriculums.**

- **Leaflets and handbooks** are relevant ways to disseminate technical information but they need to be adapted to target audience in terms of content, length, language, and drawings/text ratios.

- To guarantee construction/installation quality, it may be worth **setting-up a construction follow-up, certification or labelling system.**

- **It is primordial to set-up and/or to reinforce supply chains** by strengthening the technical, financial and/or managerial capacities of the supply chains existing links.

- **Exposure visits and workshops** are a highly efficient way to reinforce the motivation of project stakeholders while learning from other experiences.

Scaling-up needs financial incentives

- **Subsidies:**
    - **Subsidy schemes can support strategic choices and orientations.**
    - **Fully or highly subsidized projects are counterproductive.**
    - **"In kind" participation** of users (in local material & labour) needs to be estimated and incorporated in order to **adapt the level of subsidies to investment capacities.**
    - **Balance pros and cons of monetary subsidies compared to "in-kind" support.**
    - **Decrease the level of subsidies as scaling-up occurs** in order to go towards a market- based diffusion of the innovation.
    - **Assess opportunities to develop other innovative incentive mechanisms** *(e.g. joint purchasing, tax exemption, partnership with providers, etc).*

- **Loans & micro-credits:**
    - **Introduce financing schemes to cut-down the interest rates** of loans.
    - **Build capacities of MFIs on basic technical issues related to the innovation and on risk assessment.**
    - **Involve NGOs to mediate banks/MFIs** credits and assist in functions like identification of beneficiaries, conducting credit checks, mediating for loans, etc.
    - **Develop certification mechanisms or other tools** to assess the viability and quality of the installation/service that is financed.
    - **Create a shared risk account** between banks/MFIs and governments or other mechanisms (e.g. group loans) in order to secure loans and reduce transaction costs.
    - **Provide refinancing facility to the MFIs** such as revolving credit funds.
    - **Establish functional linkages between MFIs and private companies.**

- **Develop fiscal mechanisms such as tax exemptions, land policies and/or additional tax on traditional fuels.**

Scaling Up needs comprehensive financial and human resources management

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- **It is primordial for donors and decision makers to develop specific funds to support the draw-up of scaling-up strategies (preliminary work and project design).**

- **Long-term reliability and continuity of funding resources** are primordial since they prevent "stop-and-go" effects, which impacts are highly damaging.

- **Carbon market represents a significant financing source but a quite hazardous path:**
    - Intrinsic nature of projects targeted by the present document *(i.e. large number of small scale interventions)* implies **important methodological problems** as well as **complex and comprehensive monitoring requirements.**
    - It implies a **long and complex administrative process,** as well as **high transaction cost.** Income from carbon credits **are unreliable and delayed.**

- **Needs in human resources and capacity development** increase as scaling-up proceeds and are often underestimated by implementing organisations.

Scaling Up needs strong institutional set-up and partnership strategies

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- It is primordial **to carefully design the project's institutional set-up** - starting from the strategy design phase - in order to guarantee that **each activity is carried out as efficiently as possible** *(i.e. by the organizations with needed resources, competencies and legitimacy).*

- **Networking and partnerships *(e.g. Public Private Partnership)* are essential** for scaling-up since by creating synergies between actors the resulting strength of the network is bigger than the sum of individual strengths.

- **The setting-up of successful partnerships and networks is time consuming** since it involves creating a common vision, joint planning and actions and in some case common management systems.

- **Lack of coordination between likeminded organisations is often highlighted.** Project design phase may clearly identify previous or on-going initiatives and allocate specific resources and time to networking activities in order to generate synergies.

- **Develop holistic approaches by setting-up partnerships/networks with institutions working on different issues/sectors** *(e.g. energy projects are generally linked to agriculture, education and/or health issues).*

- To organize private companies in associations/networks is an efficient way to **regulate the sector, prevent bad practices and strengthen their capacities.**

Scaling Up needs strong institutional set-up and partnership strategies

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- **Monitoring systems** have to be set-up in order to provide project coordinators and decisions makers with the needed information and feedbacks regarding the efficiency of project activities and evolution of the context.

- **To be efficient, the monitoring system may involve most of the project partners and relevant stakeholders** *(e.g. creation of a M&E cell)* as they have the relevant information regarding the context evolution and needed strategic adjustments.

- **Project design should be flexible and project team needs to dispose of enough time and resource to adjust the project strategy** based on the information provided by the monitoring system *(i.e. depending of the evolution of the demand and context).*

- **Quality monitoring during construction phases as well as after sale service** are essential.

- **Setting up of an efficient system for knowledge and experience capitalisation** (and transfer to future project) is useful and relevant.

- **Specific financial and human resources for project post-evaluations are essential,** so as evaluate its real impacts and to better understand scaling-up mechanisms.

Sylvain Koch-Mathian

has over 8 year of experience in the field of renewable energy and energy planning. He previously worked on several projects related to renewable energy and rural development in both South America and Asia (VMEEA of Bolivia, UNDP, GERES). He is currently working for HESPUL on European projects on the development of sustainable energy initiatives related to both buildings and sustainable urban planning. Sylvain has a master degree in Organization, Management and Revitalization of Local Development and a Master of Engineering in the field of Renewable Energy

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Advisors

Advisory board members have been selected according to their recognized expertise in their respective fields of competences in order to guarantee the quality of project deliverables. Advisory board role has mainly been to share experiences, validate the methodological approach, provide guidance and contribute to the review of the good practice guide.

Robert Celaire

has gained 33 years experience on energy efficient and environmental building from tropical areas to very cold climates. He has experience in cold regions for example in the mid 80's with the launch and the technical assistance to an EU funded pilot passive solar project in Ladakh for the GERES and in the 2000's with a long term consultancy for various franco-chinese projects dealing with energy efficient buildings in North China. He also teaches energy efficiency and environmental building design at the National School of Architecture in Montpellier (France).

Alba Gamara

is the director of CINER (Information Centre on Renewable Energy) in Bolivia, she has relevant experience in project evaluation and monitoring as well as project management with appropriate and participative methods. (Founder member of the Latin American Association of Facilitators- ALFA). In 2007 and 2008, she was the South America Regional Coordinator of the Global Village Energy Partnership - GVEP International and she is a consultant for global initiatives as well.

Silvia Guimaraes Yafai

Head of International Programmes at the Building and Social Housing Foundation (BSHF) in the United Kingdom. She is an architect and urban planner with experience in energy-efficient design and participatory housing processes. In addition to coordinating the World Habitat Awards, a key focus of her work is on the international transfer and scaling up of innovative housing policy and practice.

Jun Dongol Hada

is responsible for Transport Sector Programme Portfolio under Rural Infrastructure Domain at Swiss Agency for Development and Cooperation (SDC) in Nepal. She also assists SDC on expanding an off-grid small hydro power scheme, which was developed as a public-private electricity company 25 years ago by the Swiss and Nepal Governments. She was previously a team leader for the

Access to Infrastructure Services Programme for Practical Action Nepal (former ITDG); where she had worked on establishing and scaling up healthy housing and renewable energy based solutions for the rural mountain people in Nepal. She is an architect and urban planner.

Christophe Rynikiewicz

is an economist with expertise in mobilising and operationalizing financing for low carbon resilient development and access to energy. His focus is on (appropriate) technologies that work and the conditions for their scaling up. He is a visiting Fellow at the Energy Group of SPRU (University of Sussex), co founder of R&R Resilience and expert for various bilateral or multilateral bodies or NGOs (HELIO International, EU GGCA, UNDP Rbec roster of experts for Low Emission Development Strategies, etc.)

Thomas Schamasch

He has an experience in small scale renewable systems in autonomous installations in Quebec. He is presently giving his time in Social Economy applied in the field of wastes management (reusing and recycling) and cooperative housing (implementing collective way of living together from co-housing to ecovillages).

Vincent Stauffer

former GERES Country Director India (2004-2010), has a good knowledge of social and political context of regions concerned by the project scope. He has over 15 years experience in the field of bioclimatic architecture in cold areas of Himalayas. In 2011, he founded a company specialised in solar greenhouse: Agrithermic.

Sonam Wangchuk

After working in Ladakh for 20 years where he spearheaded a government school reform movement called Operation New Hope (ONH) and developed on passive solar school close to Leh, he presently works to develop Low-cost Climate Responsive Buildings in the framework of the Education for Freedom Project (EFP).

Peer Review

The content of the present publication has also been improved thanks to the following experts: Marine Joos, Fredric Choffel, Aude Petelot, Bunchingiv Bazartseren, Samir Thapa.

So as to support project developers in the design of their own scaling-up strategy, a set of practical guidance, organizational charts and checklists has been developed. All these practical tools have been designed in relation with the approach and methodology developed in the handbook. Thus for each step or lever of the handbook, the author has attempted to associate one or several practical tool(s).

Before using these tools it is essential to be aware that:

- Following tools are only a modest contribution of the author to support project developers. They are provided as examples of what can be done and do not represent a universal solution.

- Some of them may be more appropriated than other depending on the innovation and environment. In certain contexts, some tools can be useless or not appropriate.

- All of these tools can be completed and significantly improved. Feedbacks of people using these tools are most welcome in order to improve them.

- It is strongly advised to define the scaling-up strategy in a participatory way involving key stakeholders. Workshops could be very relevant to work on the scaling up strategy and to complete the tools detailed in annexes.

Table of contents

All these tools are included in the attached CD
or can be downloaded on SAESUp website: www.saesup.org

/ Abbreviations

ADRA	Adventist Development and Relief Agency
AEPC	Alternative Energy Promotion Centre
ASS	After-Sale Service
BCC	Biogas Construction Company
BCF	Biogas Credit Fund
BCNS	Building Codes, Norms and relates Standards
BSP	Biogas Support Programme
BSP-N	Biogas Sector Partnership-Nepal
CBO	Community Based Organization(s)
CDM	Clean Development Mechanism
CDM	EB CDM Executive Board
DGIS	Directorate General for International Cooperation of the Netherlands
GEF	Global Environment Facility (UNDP, UNEP & World Bank)
GERES	Groupe Energies Renouvelables, Environnement et Solidarités
GHG	Greenhouse Gas(es)
GoN	Government of Nepal
GRN	Grassroots Network
GTZ	Deutsche Gesellschaft für Technische Zusamenarbeit, GmbH (German Cooperation Agency)
KfW	Kreditanstalt fur Wiederaufbau of Germany
MoU	Memorandum of Understanding
MFI	Micro Finance Institution
NBPA	Nepal Biogas Promotion Association
NGO	Non-Governmental Organization
PoA-DD	Programme of Activities Design Document
PSH	Passive Solar Housing
VER	Verified Emission Reduction
VDC	Village Development Committee
R&D	Research and Development
RTB	Rat Trap Bond
SBB	Straw-Bale Building
SBH	Straw-Bale House
SNV/N	Netherlands Development Organization in Nepal
SDC	Swiss Agency for Development and Cooperation
TVET	Technical Vocational Education & Training
UNDP	United Nations Development program

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***« Improving the winter livelihoods of rural population and setting up sustainable network
to disseminate energy efficiency in the cold desert of western Indian Himalayas »
(GERES India) - Mid-Term Independent Evaluation Report***
V. Pascal and S. Koch-Mathian, 2010

**For each project studied by SAESUp, related literature is detailed
in the cases studies that are included in the attached CD
or can be downloaded on SAESUp website: www.saesup.org**

GERES - Groupe Energies Renouvelables, Environnement et Solidarités

GERES is a French non-profit NGO created in 1976 after the first Oil Shock. Environmental conservation, climate change mitigation and adaptation, reducing energy poverty, and improving livelihood of the poor are the main focus areas for GERES. The GERES team is particularly involved in the implementation, in partnership with local stakeholders and communities, of engineering solutions for development and providing specific technical expertise. Activities include conducting energy efficiency programs, providing decentralized energy services for local economic development, supporting and developing renewable energies and promoting waste management.

Today, more than 205 staff members work on 55 innovative and sustainable development projects in France and in 12 developing countries.

Website: http://www.geres.eu

The Building and Social Housing Foundation (BSHF)

BSHF is an independent research organisation that promotes sustainable development and innovation in housing through collaborative research and knowledge transfer. Established in 1976, BSHF works both in the UK and internationally to identify innovative housing solutions and to foster the exchange of information and good practice.

BSHF believes that everyone should have access to decent housing and is committed to promoting housing policy and practice that is people centred and environmentally responsible.

Website: http://www.bshf.org/

Energy is central to sustainable development and poverty reduction efforts. Billions of people suffer from a lack of access to affordable and modern energy and related basic services and are living in unhealthy houses. Although many projects demonstrate that renewable energy and bioclimatic architecture represent cost-effective, social and environmentally friendly alternatives to improve the living conditions of rural people, most of them are facing significant difficulties to mainstream the innovation.

This manual aims at providing project developers and decisions makers with practical guidance regarding how to design a Scaling-Up Strategy for Sustainable Energy and Buildings projects. Based on the experience of 6 projects in Asia, it analyses key dynamics that allow for the scaling up process to happen and explores possible paths and drivers to replicate and mainstream an innovation. The present manual proposes a four steps method to design a strategy based on the innovation's intrinsic characteristics as well as on the local context specificities and needs.

- **Step 1/** Preliminary work: assessing the scalability, understanding the elements of context and creating a shared vision

- **Step 2/** Design of the scaling up strategy by addressing the six levers of action that are the pillars of a successful scaling-up project.

- **Step 3/** Implement the Scaling-up strategy: a comprehensive logistic management system and monitoring are essential to guarantee the efficiency of the project and to adapt the strategy to local context and environment evolutions

- **Step 4/** Design and implement the Exit Strategy: withdrawing progressively from the project while making sure that the model left behind will thrive.