Sustainability: The Elusive Dimension of International Health Projects

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ABSTRACT

Objective: The Canada-China Yunnan Maternal and Child Health Project (1997-2003) sought to improve the quality of village life and promote development of productivity and social prosperity in Yunnan province, China.

Participants: The project targeted grassroots maternal and child health workers: new and in-service village doctors; traditional village midwives; doctors at township health centres; doctors at county maternal and child health hospitals; and provincial health staff.

Setting: Ten impoverished counties (population 2.2 million) in Yunnan province with high proportions of ethnic minority populations.

Intervention: There were three major innovations: training grassroots maternal and child health workers in participatory and community-based approaches and clinical skills; designing a model comprehensive referral system including provision of basic equipment; and introducing participatory monitoring and evaluation methods. Strategies to support sustainability were built into the project from the outset.

Outcomes: Over 4,000 village, township, and county health workers received training. Maternal, infant, and under-five mortality rates declined over 30% in project counties. Project innovations were disseminated throughout the province, into other donor-funded initiatives, and integrated into national health projects by local partners.

Conclusion: Maintaining the long-term benefits of international health interventions depends on sustaining innovations beyond short project timelines. Achieving sustainability poses a conundrum to implementing agencies. Three mechanisms influenced uptake in the Yunnan project: maintaining a good fit between core project elements and the existing health system; developing adequate organizational supports; and creating a handover plan from the outset. This project highlights some of the ways in which sustainability can be operationalized.

MeSH terms: China; public health; program sustainability; diffusion of innovation; community health planning; international cooperation

La traduction du résumé se trouve à la fin de l'article.

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Health is considered a critical engine for sustainable development.¹⁻⁶ In the context of development aid, funders often enter a project hopeful that the initiative will rapidly yield learnings that the host country deems relevant and chooses to quickly infuse throughout the health care system. While donor funding can act as a temporary motor for change, maintaining the conditions for change is challenging. Unforeseen circumstances may threaten the initial uptake of innovative project design elements. Short funding cycles conflict with time needed to stimulate systems change; and potentially worthwhile health interventions may no longer be financially viable once donor funding ends.

Sustaining the long-term benefits of successful interventions involves change at individual, organizational, and institutional levels,⁷ as organizations adopt innovations and effective approaches are diffused into other parts of the system.⁸⁻¹¹ Factors shown to enhance uptake include: an appropriate and modifiable project design; building and maintenance of technical capacity among health personnel; strong community involvement; political support; adequate financing; and management and leadership capacity.^{6,12-14} The longer-term impact of novel health interventions is affected by the system's capacity to support sustainable innovations, institutionalization of innovative approaches, collaborative inter-organizational partnerships, and program champions.^{8,11,14-17} Sustainability is a process that must be attended to from the start of project implementation.^{9,18}

This paper describes an innovative maternal and child health project in rural China that was co-designed by Canadian and Chinese partners to address high mortality rates for impoverished rural women and children in Yunnan province, southwest China. The Yunnan Maternal and Child Health Project was a bilateral project funded by the Canadian International Development Agency (CIDA).

The University of Ottawa, School of Nursing (Canadian Executing Agency) partnered with the Yunnan Provincial Public Health Bureau (Chinese Executing Agency) to improve the quality of village life and promote development of productivity and social prosperity in 10 impoverished, ethnic minority counties. The project team built in supports to enhance sus-

TABLE I**An Overview of the Yunnan Maternal and Child Health Project**

Project Elements	Description
Objectives	<ul style="list-style-type: none"> To improve the quality, accessibility and timely availability of essential services for priority maternal and child health problems To support maternal and child health staff and village doctors in instituting and maintaining dynamic relationships and action with rural women, village midwives, and other groups for improvements in maternal and child health To increase the relevancy and responsiveness of continuing education programming for maternal and child health trainers and trainees regarding the needs and priorities of rural women and children.
Training Methods	<ul style="list-style-type: none"> Holistic learning methodology, that aimed to build skills in communication and group dynamics, critical analysis, clinical skills, and personal growth Participatory training methods centred on cycles of reflection-action-assessment Supportive working relationships fostered among different categories of health workers at village, township, county, and provincial levels.
Trainees	<ul style="list-style-type: none"> Train-the-trainer cascade structure unfolding from provincial level to county, township, and village levels. Trainees included: <ul style="list-style-type: none"> 19 provincial-level staff, primarily physicians who were prepared as “key trainers” in a 3-month training program 172 county-level health staff who were prepared as “county trainers” in a 3-month training program led by key trainers 22 county-level trainers who received an additional 3 weeks training to prepare them as “back-up key trainers” 256 township hospital doctors who received 6 months of in-service training in a county hospital 2,276 village doctors who had been working in their communities, often for extensive time periods, who received a 90-day training program from county-level trainers 1,327 new female village doctors and midwives who received 80-110 days of training from county-level trainers.
Governance	<ul style="list-style-type: none"> Canadian executing agency reporting to CIDA Chinese executing agency reporting to Chinese Ministry of Trade and Commerce (MOFCOM) Joint Project Steering Committee directed by CIDA and MOFCOM, providing oversight and approval of annual budgets, work plans, and overall project direction.

TABLE II**Assessment Factors Relevant to Sustainability**

Phases of Sustainability	Assessment Questions
Initial organizational uptake	<ul style="list-style-type: none"> What structures need to be put in place by the organization to support trainees’ implementation of innovative and unfamiliar project activities? How would developing project guidelines help partners deepen their understanding of the innovations being introduced? How will sustainability be managed during planned transition periods?
Routinization within organizations	<ul style="list-style-type: none"> Do existing supervisory processes and policies support uptake of project innovations? How do innovations need to be adapted at each level of the system? How can innovation success stories be shared among those involved in project implementation?
Longer-term expansion within the health system	<ul style="list-style-type: none"> Does the organization’s involvement in other international and domestic projects offer additional opportunities to disseminate project innovations? What are the signals for readiness to adopt innovations in other parts of the system?

tainability from the outset, while maintaining flexibility to respond to unexpected challenges during implementation. Following a description of the project, an analysis shows how emerging threats led to adaptation of the design. Finally, assessment questions that may be used to examine critical elements of sustainability are posed.

PARTICIPANTS, SETTING AND INTERVENTION

The project featured three major interventions: training grassroots maternal and child health workers in participatory and community-based approaches and clinical skills; designing a model comprehensive referral system including provision of basic equipment; and introducing participatory monitoring and evaluation methods.¹⁹ (See Table I).

The project design incorporated strategies to infuse new approaches through the system and increase uptake beyond project counties. Local counterparts were identified for all Canadian technical personnel. Through a process of mentoring and mutual learning, counterparts became critical project champions. Iterative results-based management provided budgetary and implementation flexibility,²⁰ so that the project team could effectively address externally-driven events that threatened sustainability. Participatory management allowed the project team to make adjustments during key transition points, such as the mid-project handover of the training component to Chinese partners.²¹

OUTCOMES

Health systems changes

Large-scale change was successfully introduced in project counties within a short

funding cycle. Over 4,000 maternal and child health workers at village, township, and county levels were trained in community and clinical skills. Project results included reductions of more than 30% in maternal, infant and under-five mortality rates across the 10 project counties.^{19,21,22} (See Figure 1.) Improvements in health status indicators in project areas exceeded those in other Yunnan counties during the same time period, as well as those achieved by the World Bank Health VI Project.^{22,23}

As the project proceeded, uptake of participatory methods gained momentum through our partners’ efforts to scale up project elements provincially and nationally. The Provincial Health Bureau Director introduced health leaders from all 128 Yunnan counties to participatory training, monitoring and evaluation, and results-based management; and funded training in non-project counties. Project lead trainers

Figure 1. Change in Mortality Rates in Project Counties, 1997-2002

NOTE: Activities to mobilize political and health leaders in all ten project counties began in 1997 at the start of the project. Counties were divided into two groups for training implementation. Training began first in six "Phase 1" counties in 1998, followed by roll-out in the remaining four "Phase 2" counties in 1999. Data in this figure were obtained from routinely collected data by the Yunnan Provincial Public Health Bureau.

were invited by other international donors and national health experts to help design participatory training, monitoring and evaluation initiatives for Yunnan and elsewhere in China. Advocacy by the participatory monitoring and evaluation leader and the Health Bureau Director led to a national "Yunnan experience-sharing" workshop, hosted by CIDA and the Chinese Ministry of Commerce, that profiled project innovations to health officials from 13 Chinese provinces. The model comprehensive referral system was subsequently incorporated by the national Ministry of Health into a project to reduce maternal and neonatal mortality across western China.

Threats to sustainability

Uneven Support for Training Innovation
Our first fundamental threat to sustainability occurred with the attrition of two thirds

of the first training cohort (provincial-level "key trainers" who were to lead the entire training cascade). In many ways, the three-month training, held in the provincial capital with field visits to counties, had been a resounding success: in debriefings, trainees described the training as transformative and highly relevant, and were eager to use their new skills. Yet, on return to their communities, it became obvious that organizational supports were insufficient. Trainers' normal work unit bonuses were in jeopardy. Work unit leaders expressed doubt about the utility and appropriateness of participatory approaches for village health workers with little formal education. Without strong support from local leaders, key trainers were unwilling to commit to longer-term involvement.

Although the Chinese project director strongly endorsed the project's participatory methods, trainers, trainees and hospital leaders found the learner-centred focus and

community-based approach to be a challenging departure from more standard didactic methods. As project activities cascaded from provincial to village levels, trainers encountered widely varying learning needs, literacy levels, and clinical competencies. Time was required for managers to develop supportive supervisory processes, and for the Provincial Health Bureau to develop new strategies for monitoring and evaluation. The project team responded by increasing the number of guidance and monitoring visits by senior trainers and meeting regularly with local leaders; hiring clinical experts to support county-level training activities; and revising the curriculum to provide more time and support for the transformative process of reflection, action, and assessment.

Introducing Innovation Amid a Shifting Political Landscape

The implementation context changed considerably during the project. Senior health managers in Yunnan were involved with a growing number of international projects, each with its own vision and approach, management demands, and incentives. At the same time, significant national reforms halved the number of government ministries and led to amalgamation of some divisions of the Provincial Health Bureau. Consequently, project staff faced additional work demands and increasing uncertainty about salaries and job security. Because Canadian management and field visits to Yunnan proved essential for understanding the shifting context, we avoided pushing for change driven solely by project time-lines rather than by considerations of readiness at different levels of the system.

Supports for sustainability

Developing Strong, Transparent Partnerships

The two executing agencies built a relationship characterized by a high level of trust, shared learning, and participatory decision-making.²¹ Co-development of an extensive set of project guidelines facilitated cross-cultural communication, clarified assumptions, and established consensus on fundamental project issues. For example, the "Guidelines for Training Grassroots Maternal and Child Health Workers" defined underlying participatory approach-

es and skill sets for building community health capacity. Other guidelines focussed on training per diems, monitoring and evaluation approaches, communication and decision-making, and equipment maintenance and replacement. Written guidelines fit well with the Chinese regulatory structure; our counterparts could communicate decisions to local governments through official letters issued by the provincial government.

Managing Planned Transition Points

An early handover to Chinese partners midway through the project was a crucial design element, clearly indicating intent for the project to be Chinese-owned. Yunnan and Canadian counterparts were selected for all significant project roles, then mentored and trained before, during, and after handover in order to build local capacity and ownership. The Canadian team remained small; only the Canadian lead trainer was present in Yunnan full-time, and only for the first half of the project. The Chinese lead trainer took on increasing responsibility for teaching, curriculum planning, and supervision, assuming complete responsibility after handover.

Local Champions Who Led Integration Efforts

Project champions emerged within three influential nodes in the health system: Provincial Health Bureau leaders (who could influence diffusion throughout Yunnan, and into other provinces and the national Ministry of Health); the training cadre (who could provide the expertise and rationale for extension into new counties and other projects); and senior managers within the health information system (who could integrate participatory monitoring and evaluation methods into routine health data). As growing field experience demonstrated the relevance of participatory approaches, champions were able to garner additional financial and leadership commitments to support systems change. For example, to address trainees' difficulties with applying community-based processes, Chinese lead trainers convinced Provincial Health Bureau officials to support an inter-county 'best practices' event: one county where skills were strong showcased its activities through a short training course for trainers from weaker counties.

Similarly, the team leader of the locally-led participatory monitoring and evaluation component helped routinize the methodology within the provincial health information system. Her team adapted participatory monitoring and evaluation approaches to fit the culture and context of rural China, and introduced them into provincial and county hospital management systems.

DISCUSSION

The Yunnan Project experience illustrates a number of important lessons for fostering long-term institutionalization of innovative community health approaches. Three key mechanisms, or sustainability levers, influenced uptake: maintaining a good fit between core project elements and the existing health system; creating supporting organizational structures; and designing a transition plan at the start of the project. This is consistent with the conceptual model for sustainability planning proposed by Johnson et al.,¹⁵ which describes factors affecting "sustainability readiness". Factors include enhancing community capacity to integrate innovative practices into existing health systems, and addressing underlying elements that can support or threaten the sustainability of newly introduced innovations. Sustainability readiness does not just happen; enabling structures must be established and nurtured throughout the life of the project. Readiness must also be informed by ongoing assessment across all levels of the system. In Table II, we propose a set of assessment questions that may be used to examine critical elements of sustainability during various project phases.

A thorough understanding of the implementation setting facilitates identification and operationalization of sustainability levers. Deep engagement with local partners is essential to set appropriate project direction, and to reveal emerging opportunities and constraints arising within both the health system and the broader socio-political environment.

Stakeholders throughout the health system need clarity on the innovation and its attributes. We described participatory processes from the project's outset and made them tangible through joint development of guidelines, modeling the innovation, and having stakeholders observe and

engage in the innovation. Our partners, in turn, profiled local success stories that unfolded during the training process.

Once innovations are introduced, they must be infused through multiple layers of the system. It was important to support and mentor local champions who introduced and sustained essential elements of the innovation throughout the health system and with the wide array of stakeholders who needed to become aware of the innovations.

While donor agencies may envision a blueprint model for dissemination, the context for sustainability changes after donor funding ends and costs of institutionalization must be fully borne by local partners. In our experience, implementation strategies or structures may be adapted, or rates of uptake adjusted to be more consistent with current realities and competing priorities. Partners may find opportunities to infuse innovations into other internationally-funded programs or domestic initiatives.

CONCLUSION

Although funding agencies give strong verbal weight to the need for sustainability, operationalizing this important project dimension poses a challenge to implementing agencies. The seeds for sustainability can be sown at the beginning of a bilateral project through planning for the organizational integration of innovative features and considering the structures necessary for supporting long-term change beyond the funding period. The Yunnan project illustrates potential threats to sustainability that require vigilance, and emerging supports for sustainability that require mobilization.

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RÉSUMÉ

Objectif : Le Programme sino-canadien de santé des mères et des enfants du Yunnan (1997-2003) visait à améliorer la qualité de vie dans les villages et à promouvoir le développement de la productivité et de la prospérité sociale dans la province chinoise du Yunnan.

Participants : Le programme s'adressait aux travailleuses et aux travailleurs locaux de la santé maternelle et infantile : les nouveaux médecins et les médecins en exercice dans les villages; les sages-femmes traditionnelles dans les villages; les médecins des centres sanitaires de district; les médecins des hôpitaux pour femmes et pour enfants des comtés; ainsi que le personnel de santé provincial.

Lieu : Dix comtés pauvres (2,2 millions d'habitants) de la province du Yunnan ayant de nombreuses populations issues de minorités ethniques.

Intervention : Il y en a eu trois principales : la formation des travailleuses et des travailleurs locaux de la santé maternelle et infantile aux approches participatives et communautaires et aux techniques de soins cliniques; la conception d'un modèle de système global d'aiguillage incluant la fourniture de l'équipement de base; et la présentation de méthodes de suivi-évaluation participatives. Des stratégies d'appui à la durabilité ont été intégrées dans le programme dès le début.

Résultats : Plus de 4 000 travailleuses et travailleurs de la santé dans les villages, les districts et les comtés ont reçu une formation. Les taux de mortalité chez les mères, les nourrissons et les enfants de moins de cinq ans ont baissé de plus de 30 % dans les comtés visés par le programme. Des partenaires locaux ont diffusé les innovations du programme dans toute la province; elles ont ensuite été intégrées dans les initiatives d'autres bailleurs de fonds et dans des projets de santé nationaux.

Conclusion : Le maintien à long terme des avantages d'interventions de santé internationale dépend de ce que l'on assure la continuité des innovations au-delà de la brève durée de vie des programmes. La durabilité présente un dilemme pour les organismes de mise en œuvre. Trois mécanismes ont influencé l'acceptation du programme au Yunnan : le bon ajustement entre les éléments de base du programme et le système de santé existant; la mise au point de mesures de soutien organisationnel adéquates; et la création, dès le début, d'un plan de prise en charge. Ce programme met en évidence quelques-uns des moyens d'opérationnaliser la durabilité.