Three Case Studies Applying the Scaling Principles of the Scaling Community of Practice

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Preface

This collection of three case studies was prepared with the goal of demonstrating how the Scaling Principles of the Scaling Community of Practice can be applied to actual cases of scaling.[1] All three cases are "retrospective" in the sense that they look back at scaling experience for three programs or initiatives and explore how their scaling approaches align with the Scaling Principles and whether the Principles provide a useful lens through which to assess actual scaling experience, both in monitoring ongoing scaling efforts and in ex post evaluations of completed programs. They also offer two alternative templates of how future case studies might be conducted to provide a broader basis for understanding and assessment of the Principles – one which applies the principles and lessons at the level of individual lessons (in the first two case studies), while the other only applies only the principles, not the specific lessons (in the third case study).

The three cases are distinct in nature: The first case involves an assessment of Progresa-Oportunidades, a major national program of conditional cash transfers in Mexico, as interpreted by the principal architect of this pathbreaking scaling initiative in a major retrospective study in 2006. This program started in 1997 and was closed in 2019, allowing a retrospective of a completed scaling initiative. The second case covers the introduction and scaling of a biomass fuel program in Moldova that was supported by the United Nations Development Program (UNDP) and assessed in 2016 by the author on behalf of UNDP in mid-stream. The third case reviews the creation of a new initiative by the World Meteorological Organization to improve the collection and sharing of weather observations in the Least Developed Countries and Small Island Development States with the goal of improving weather and climate prediction in these countries and around the globe. The evidence for this case is based on the personal experience of the author as a member of the team preparing this initiative. The implementation of this initiative will start in July 2022; hence one can assess the application of the principles only based on the scaling strategy as it emerged from the preparation process.

Each of these three case studies refers to important development and climate initiatives that deserve consideration in their own right. This paper cannot do justice to the many relevant features of each case, but provides the reader with information and links to background documentation.

Based on these three case studies, the author concludes that the Scaling Principles are potentially effective and robust for the retrospective analysis of particular cases of scaling, for identifying strengths and weaknesses in the scaling process, and for assessing the preparation of a scaling strategy. However, more case applications are needed across more sectors and thematic areas, both retrospectively and especially prospectively (as a tool to assist the process of scaling). More applications will make it possible to judge reliably the practical value of the Scaling Principles and to adapt them as needed.

[1] These Scaling Principles are based on a review of the scaling literature and practice found in Kohl and Linn (2021).

Looking ahead, particular questions that further case study work might address are these:

- How useful are the scaling principles as a guide to development practitioners not just in retrospective assessments, but when systematically applied in the actual design and during the implementation of scaling strategies?
- What is the impact of not applying some principles and/or of applying some principles in greater analytical depth? Or in other words, what is "good enough" an application of the principles?
- When should one apply which specific scaling tools (scalability assessments, stakeholder mapping, political economy analysis, participatory approaches, etc.) instead of high-level judgments of the relevance and impact of particular principles and lessons?
- How does the application of some the newer dimensions of the Scaling Principles (optimal scale, participatory scaling, assessment of losers from scaling, allowing for considerations of equity, human rights and dignity, etc.) affect the scaling preparation and delivery process?
- What are the costs in terms of increased effort, time and financing requirements of systematically applying the scaling principles relative to the benefits of doing so?

Scaling Mexico's Conditional Cash Transfer Program:

The experience of scaling the Progresa-Oportunidades program

1. Introduction

Progresa-Oportunidades, the Mexican program of conditional cash transfers, was introduced and scaled over the period 1995-2005 and beyond. It represents a unique experience, first, because it was one of the earliest efforts to design and scale a conditional cash transfer initiative at a national level, and second, because the experience with introducing and scaling Progresa-Oportunidades was analyzed in detail by the person most directly responsible for this process, Santiago Levy,[2] in his book "Progress Against Poverty: Sustaining Mexico's Progresa-Oportunidades Program" (2006), sponsored by the Wolfensohn Center for Development at the Brookings Institution. (See References section at the end of this case study.)

This case study is based on the information and analysis provided in Levy's book, which offers an excellent basis for testing the applicability and usefulness of the eight scaling principles and 21 scaling lessons developed by the Scaling Community of Practice (Scaling Community of Practice 2022). The study further benefitted during its preparation from Levy's comments on an early draft. While reporting briefly in the concluding section on the continuation of the program after 2006, this case study does not analyze the scaling experience of Progresa-Oportunidades beyond 2005.

2. Progresa-Oportunidades: Overview

A brief description of the key elements of Progresa-Oportunidades is provided in the introduction of Levy's book and is reproduced here verbatim:

> *"In 1997 Mexico launched a new incentive-based poverty reduction program, initially known as Progresa and now as Oportunidades, to enhance the human capital of those living in extreme poverty. The program started under the administration of President Ernesto Zedillo, with initial coverage of 300,000 families in 6,344 localities in twelve states and a budget of US$58.8 million.*
>
> *"At that time, Progresa-Oportunidades was a novel initiative, inasmuch as it*
>
> - *sought to substitute cash income transfers for the income transfers in the form of targeted or generalized food subsidies (through price discounts, price controls, in-kind distribution of food items, and the like), giving beneficiary families complete freedom in their spending decisions*
> - *conditioned the receipt of cash transfers on specific patterns of behavior by the beneficiary household*
> - *packaged nutritional, health and educational benefits together to exploit their complementarities*
> - *adopted a life-cycle approach to avoid long-term welfare dependence*
> - *included evaluations of program operations and impacts as part of program design*
> - *applied strict guidelines for selecting beneficiaries*
> - *delivered benefits directly to beneficiaries, with no intermediaries.*

[2] Santiago Levy served as the Deputy Minister at the Ministry of Finance and Public Credit from 1994 to 2000 and was the main architect of the Progresa-Oportunidades Program.

"At the end of 2005, under the administration of President Vicente Fox, Progresa-Oportunidades covered 5 million families, representing almost 24 percent of the country's population and practically all households living in extreme poverty. It operated in more than 86,000 localities in all thirty-one states of the country, with a budget of US$2.8 billion. Over the course of this period, many scholars evaluated the program, principally in terms of its impact on beneficiaries' consumption, health, nutrition, investment, intrahousehold relationships, use of labor time, and migration patterns. They also evaluated the program's method of targeting eligible households and its effects on poverty indicators. Results to date have been positive; perhaps one could say very positive. Because of its novel approach and its results so far, Progresa-Oportunidades has at times been mentioned as an initiative that may provide useful lessons for reducing poverty in other countries." (Levy 2006, p. 1/2)

3. Applying the Principles and Lessons

Based on Levy's book[3], this section assesses how the scaling principles and the relevant lessons under each principle apply to the scaling approach used for the Progresa-Oportunidades program (P-O).

A. What is the vision of scale?

Principle 1: Develop from the outset and in a participatory way a context-specific vision of the problem(s) that need(s) to be addressed and the expected pathway and impact of interventions at optimal and sustainable scale.

Consistent with Principle 1, Levy notes that "*clarity is necessary regarding what problem is to be solved,… it is important to have a vision from the beginning regarding scope and duration of the program, [and] it is indispensable to incorporate into program design and operations those elements that can make a decisive contribution to program continuity" across political cycles.*" (p. 146/7) Taking key elements in turn, Principle 1 and its three lessons are reflected in P-O's design and implementation as follows

Lessons

Begin with the end in mind: The conception and preparation of P-O started from a careful analysis of the problems with the existing system of social support in Mexico, and in particular the existing programs of in-kind food subsidies, which were judged highly inefficient and ineffective in reaching the poor. The principal problems were identified as follows:

- Imbalance between urban-rural and between general-targeted subsidies
- Difficulty of delivery of food subsidies to rural areas
- High admin expenses
- Poor coordination of multiple agencies
- Lack of focus on vulnerable members of households
- No evaluation
- Ineffective and inefficient means to reduce poverty
- Uneven educational, health and nutrition achievements, not addressed by current subsidies

Research had further indicated a number of important factors that needed to be taken into consideration:

- Interdependency of anti-poverty solutions (income, nutrition, health and education), resulting in the need for complementary interventions

[3] All page references to quotes in the text refer to Levy (2006).

- Need for direct involvement of the poor with more control over their resources, better information, participation, choice and responsibility
- Need to design a system of transitory, rather than permanent payments to poor households, following a life-cycle approach, designed not to create lasting dependence and not to reduce incentives to work.

In Levy's framework of scaling a long-term vision is a "sine qua non" for successful scaling. (p. 129) From the outset, the vision for P-O was to design a system that would reach the entire population in extreme poverty, almost a third of the Mexican population. As Levy puts it: *"[T]here was a long-term vision and a single objective: to design a technically sound, perhaps innovative program to redistribute income to the poor while enhancing their human capital; to fund the program in a macroeconomically sustainable way; to implement it in a transparent and politically neutral fashion; to evaluate it systematically and render clear accounts; and to extend its benefits to all of Mexico's poor households*." (p. 122) There was also a recognition that continuity and sustainability of the program were critical, considering the long-term nature of the poverty problem and the underlying lack of human capital which had to be addressed to achieve the productivity increases of the poor that would allow them to escape poverty eventually without program support. Moreover, as Levy points out (p.19), P-O was conceived of as part of a larger poverty alleviation strategy, but he also notes that in its execution this part of the vision was not effectively pursued. (p. 127, 143)

Aim for optimal, not maximum scale: The scale goal of P-O was set at reaching 5 million households, roughly equivalent to Mexico's extremely poor population. This goal reflected the desire to focus on the extremely poor population, while also recognizing that it would be difficult to reach the populations in the most remote, small and dispersed rural communities.[4]

Form the scaling vision in a participatory way: The P-O vision was formed over a roughly two-year period based on extensive research and exchanges with the research community, and on discussions with stakeholders in the Mexican government, esp. the Cabinet and Congress.[5] It also involved surveys of poor households' preferences (e.g., between in-kind and cash subsidies) but, as Levy notes, reflected a "top-down" program design, since it did not involve direct participation by prospective beneficiaries or their communities. However, the program was designed to give households much greater choice about how to spend the subsidies put at their disposal and to empower them with provision of better nutrition, health services and education for their children.

B. What to scale?

Principle 2: Define the core elements of the intervention (or intervention package) to be scaled and assess whether it can be sustainably scaled in a particular context.

The decision of what to scale involves two specific lessons under Principle 2:

Lessons

***Focus on core elements of an innovation*:** According to Levy, the design of the program involved a careful assessment of key components in terms of the likely impact, complementarity, scalability and

[4] Levy, personal communication.

[5] According to Levy (personal communication) the vision was initially not shared widely, even by members of the Cabinet. Support in Congress was also initially limited, but turned strong when the positive impact of P-O was demonstrated by the evaluations.

sustainability that in their entirety represented an innovation over past approached in Mexico and elsewhere (p. 33):

- Three sets of interventions (nutrition, health and education)
- Conditionality of assistance
- New targeting methods
- Benefits directed to mothers
- Replaced in-kind subsidies with cash subsidies
- Life-cycle approach
- All these elements at the same time

While some specific aspects of the program were changed over time in line with emerging evidence (see below), these core components were maintained throughout and any pressures to expand the scope of the program was resisted in the interest of effective delivery and maintenance of quality.

Assess scalability: While no formal scalability tool was used in assessing scalability of the program (and no such tool was available at the time), the preparation and design of the program involved intensive consideration of key factors which would determine scalability and sustainability, esp. political and budgetary factors, as well as the capacity of the education and health infrastructure to respond to increases in demand (see below). In addition, a pilot project was implemented at the outset to test the approach – involving 31,000 households in the state of Campeche, followed by an external evaluation –, which validated the basic approach by demonstrating that the proposed interventions were more effective than the existing subsidy schemes. But the evaluation also led to revision of (a) the targeting approach, (b) data collection and (c) administrative structure. In sum, the pilot and its evaluation served as motivator for the decision to go ahead, but also contributed to a more impactful and scalable solution and incorporation of evaluation into the program itself for ongoing verification of impact and optimal design.

C. Who will scale?

Principle 3: Identify, engage and coordinate leaders, champions, intermediaries, partners and public/private actors to fill key roles in driving, funding and implementing scaling.

Going to scale rarely happens spontaneously or by itself. Four principal lessons show that four sets of actors – mostly organizations, but also individuals – need to engage and cooperate in scaling, with potentially changing roles over the scaling process.

Lessons

Find and convince leaders: Levy notes that *"[p]residential leadership was essential to the implementation and success of the program*." (p. 15) Aside from providing overarching political backing, it was key for effective coordination across agencies in the absence of a well-established inter-agency coordination mechanism.

Identify and empower one or more intermediaries*:* The creators of P-O recognized early on that one agency needed to coordinate other agencies/actors and to control of budget and its distribution across agencies. This required the establishment of a new agency with well-articulated legal powers to support rapid start-up and to minimized resistance to implementation in the short-term. Levy recognized that this involved a tradeoff between the required adjustments in the other agencies (esp. in the health and education ministries) on the one hand and their buy-in and ownership of the P-O program on the other.

Create and leverage partnerships. The role of other government agencies was clearly recognized, consultations were regularly held, and their active support was sought, even if not always fully achieved. The same holds true for continuing engagement with Congress and the research community. The latter was critical for ensuring effective independent evaluation of the program. Finally, among external partners, the multilateral development banks (MDBs), while not involved in setting up P-O in the early stages (aside from provision of some technical assistance), were brought in later to provide financial and technical support. The engagement and support of these external partners also helped secure continuity of domestic political backing for the program.

Ensure that public action and private action are consistent and mutually reinforcing: The P-O program was a purely public sector initiative by the Federal Government in support of poor Mexicans. However, the assessment of the problem with existing in-kind food subsidies and the effective implementation of the program required a sound understanding of how private markets and key private sector actors functioned. For example, the old food subsidy scheme provided significant benefits to the private operators in the supply chain of publicly procured food and discouraged local production of food items in poor communities. In contrast, the cash subsidy under P-O minimized leakages to private operators and allowed local production to thrive, as confirmed by evaluations.

D. How to plan for scaling?

Principle 4: From the outset, identify systemic opportunities, constraints and risks; plan to align with them or address them through system change along the scaling pathway.

Understanding and addressing systemic opportunities, constraints and risks was critical for the successful scaling up of P-O as illustrated with reference to the following three lessons.

Lessons

***Map and address systemic enabling factors and constraints*:** While not engaging in a formal systems-mapping process in preparing and implementing P-O, the Mexican authorities paid special attention to systemic constraints, including political, institutional and budgetary (see next lesson).

Political constraints: It was recognized that P-O in tandem with abolition of existing subsidy programs would result not only in winners, but also in some losers. The losers included non-poor beneficiaries of the former in-kind food subsidies (mostly urban consumers) and intermediary commercial entities and agencies that were recipients of rents along the food value chain. These groups could have stalled progress of P-O if left unattended. Gradual elimination of the old subsidies helped, especially in an inflationary context, where price increases due to removal of subsidies where less notable than during a low inflation setting. Active engagement with the concerned ministries and agencies, as well as with Congress, in demonstrating the benefits of the P-O program relative to existing programs, based in part of the evaluation of the pilot program and continuing evaluation of program impacts, was another important element in overcoming political opposition. Nonetheless, Levy concludes that more could have been done to ease the transition for the losers (p. 94/5).

Other political concerns included the political transition from one presidential administration to the next and the common pressure to introduce new programs rather than continuing scaling the P-O program once started. Strong evidence of impact, removal of the program from partisan politics through specific legal provisions (no additions to program beneficiaries six months before a presidential election), persistent outreach across the political spectrum by the program leadership help create the conditions for political continuity. P-O survived the transition from President Zedillio to President Fox after two-and-a-half years of its existence.

Institutional infrastructure constraints: Various institutional challenges had to be addressed and raised in some cases difficult tradeoffs for decision makers:

- Rather than relying on existing institutions a centralized administration was created at the federal level with no administrative layers between the federal agency and the beneficiaries. The absence of state and municipal entities responsible for administering the program facilitated administration, kept costs low and helped avoid corruption and political interference, but also meant there was little ownership of these decentralized levels of government in making the program a success.
- The lack of ownership and engagement was also a factor for engagement with the education and health agencies, whose support was needed in helping to absorb the increased demands on health clinics and on schools, as utilization and enrollment increased. This resulted in reductions in quality of services, even as access substantially increased. Interagency coordination was a challenge, as noted earlier, and in the absence of more permanent incentives and processes had to be created as best as possible by relying on presidential leadership.[6]
- Finally, transparency, access to information, evaluation and audit had to be assured and was introduced as part of the budget decree in the interest of credibility, accountability, sustainability (p. 103). Introduction of these features was facilitated by the turn to democracy in Mexico during P-O implementation and was particularly welcomed by the opposition in Congress.[7]

Pay special attention to financing and cost constraints. P-O was initiated during a macroeconomic crisis. This created political opportunities for action, but also meant that severe budget constraints had to be accounted for. This was one reason for the decision to go for budget neutrality and hence strict substitution, not addition of resources required for P-O. Another was the fact that budgetary restraint and a commitment to avoid tax increases was regarded as critical for scalability and sustainability of P-O. After the initial years, the principle of budget neutrality could be relaxed since overall budget resources expanded with economic recovery and oil price increase. Careful cost analysis of the program underpinned the fiscal planning which was part of the program preparation and implementation process.

Assess and address risks. Levy identifies a number of risks. These were addressed to varying degrees in the design of the program:

- The continued existence of remaining food subsidy program agencies could lead to a resurgence of new in-kind programs competing with P-O;
- Economic, fiscal, or political crises could derail the program;
- Political manipulation or accusations of corruption or fraud might prove disruptive, even in the absence of actual occurrence;
- Failure to develop and implement an overall poverty strategy consistent with the design of P-O would detract from the ultimate effectiveness of the program;
- At the same time expansions of program scope for political reasons was a possibility, which would complicate the delivery and risk diluting the quality of the program;
- Lack of enforcement of program conditions in delivery was a risk;

[6] Levy (personal communication) notes that the problem was especially serious at the subnational level; at the federal level the health and education ministries had more sense of ownership because they got extra resources and because, little by little, they realized that the program was furthering their own goals.
[7] Levy (personal communication).

- Lack of consistency with other anti-poverty programs in absence of a consistent overall poverty strategy could result in incompatible incentives for the poor and might mean that they could get stuck in low-productivity informal sector jobs and thus affects achievement of the program's long-term goal;[8]
- Overall, Levy assessed that at the time of his writing P-O remained a fragile program. (p. 139)

Principle 5: Develop in a participatory way a scaling strategy and implementation pathway(s) to achieve the sustainable scaling vision.

With its long-term strategic perspective and approach to scaling P-O was consistent with this principle and the key lesson under it.

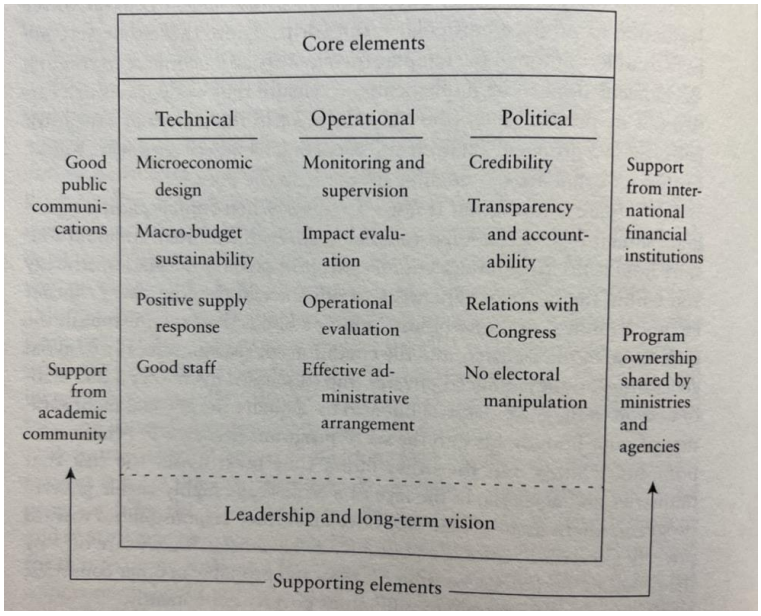
Lesson

Link the vision with the innovation by developing a strategic and sustainable scaling pathway.
According to Levy P-O implementation was based on a clear strategy linking a number of core and supportive elements in an "all-or-nothing package" as shown in Fig. 1 below (p. 128/9):

- Leadership and long-term vision provided the foundation for technical, operational and political core elements; and
- Good communications, support from the academic community, program ownership by the public agencies and support from the MDBs represented supportive elements.

All elements are tied together by strict rules of operation, transparent and verifiable targeting mechanism, and thorough evaluation. As for the development of the P-O vision, there was no direct participation of the beneficiaries in the formulation of the P-O scaling strategy.

Figure 1: P-O Scaling Pathway Elements

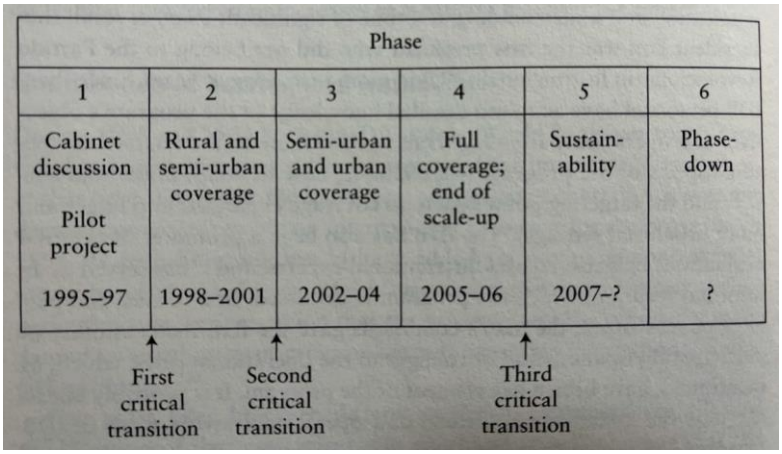


Source: Levy 2006, p. 128

[8] Levy (personal communication) noted that this turned out to be a very serious problem that was underestimated at the beginning, and then never corrected, and indeed got worse over time, as documented in his subsequent book on Mexico's social policy (Levy 2008).

The scaling pathway for P-O was structured in six phases, as shown in Figure 2 below, with rural areas reached and more marginalized communities first, large urban areas last. Phases 1, 2-3, and 4-5 map directly into the three typical scaling phases identified by Kohl and Linn (2021) – "development and testing of an innovation; going to scale; and implementing at scale." Phase 6 ("phase-down") is envisaged to occur eventually when the need for P-O declines due to the productivity gains of targeted beneficiaries in P-O's lifecycle of benefit delivery model as a result of P-O and the broader poverty strategy in which it ideally is to be embedded – and in the absence of such an effective strategy Phase 6 remains a "chimera", according to Levy (p. 144). According to Levy (personal communication) "Phase 6 never occurred because of problems outside the program. In short, labor informality impeded translating the gains in human capital into more productive and better paid jobs. The scale-down issue was never solved nor recognized."

Figure 2: P-O Scaling Pathway Phases



Source: Levy 2006, p. 116

E. How to implement scaling?

Principle 6: In line with the scaling strategy, mobilize resources and institutional capacity and create demand for the scaling initiative by aligning incentives and pursuing advocacy to enlist stakeholders and change attitudes, mindsets and social norms.

The P-O program demonstrates key aspects of Principle 6 as reflected in the following four lessons.

Lessons

Mobilize resources and institutional capacity for scaling and for sustained implementation at scale. During P-O implementation, the focus on resource mobilization and development of institutional capacity continued and showed considerable success, helped among other things by the recovery of the Mexican economy.

Pay attention not only to the supply side of the scaling process, but also the demand side: P-O surveys indicated consistently that recipients preferred cash subsidies over in-kind subsidies, and that mothers, in particular, would react positively to conditional cash transfers in helping to ensure that conditions were met and thus cash payments received. The program also paid close attention to generating and sustaining the political demand for the program by engagement and information sharing with relevant political actors, esp. Congress.

Align interests and generate incentives: The program succeeded in aligning incentives for recipients so that rapid uptake would take place, while also aiming to ensure that the incentives did not encourage long-term dependency of households on government handouts. It also aligned incentives for politicians to support the program in a non-partisan way and to ensure that it continued across political cycles. P-O was less successful, according to Levy, in aligning incentives for government agencies/ministries whose cooperation was needed for successful implementation.

Communicate and advocate based on evidence: The program had an active communication and advocacy effort with Congress and relevant public agencies, but initially proceeded cautiously with communication to the wider public, since it did not want to raise excessive expectations; as the effectiveness of the program became clear, the public information campaign was ramped up.

Principle 7: Iterate, learn, adapt and sustain the scaling pathway as long as needed.

Lessons

Iterate, learn, adapt: The P-O had a clear and sustained vision, objective and strategy, but according to Levy did not have an *"exact, predetermined ten-year plan.*" Instead, it involved a "*process of learning, correction, and adaptation in various dimensions: technical, administrative, operational, and political… the ability to adapt strategies and procedures has been central to the program's success*" (p. 122). Consistent with this approach, program modifications were made in light of experience and evaluation, including improved nutritional supplementation, expanded education, and additional health information. (Figure 3)

Figure 3: Modifications in the P-O Program

Benefit	*July 1997–December 2000*	*January 2001–December 2002*	*January 2003–December 2005*
Nutrition	Nutritional supplements	Same	Improved formula for supplements
Health care	Preventive health interventions Health talks	Expanded health topics for mothers and youngsters	Same
Education	School supplies Education grants until secondary school	Education grants until high school	Additional cash transfers on completion of high school

Source: Levy 2006

Focus on sustainability: The design and implementation of P-O was focused very explicitly on sustainability in multiple dimensions: political, institutional and budgetary, as noted earlier.

Maintain a long-term perspective: The scaling pathway for P-O was deliberately designed with a long-term perspective in mind. The scaling phase of the program took nine years (1998-2006; see Figure 2). The sustainability phase was expected to last for decades based on the life-cycle model of successive poor households entering and leaving the program.

F. Based on what evidence?

Principle 8: Base all scaling decisions on relevant evidence and continuous learning.

Levy noted that the lack of evidence for program impact was key problem in the case of the subsidy programs which P-O replaced. Therefore, it comes as no surprise that P-O is fully consistent with Principle 8 and the lesson under it.

Lesson

Collect and apply evidence throughout. Systematic, comprehensive data collection and evaluation was a hallmark of the P-O program throughout the first 12 years, starting with program preparation, followed by the pilot phase and then the scaling up process; this in effect required the development of a data and evaluation infrastructure as part of program development and implementation. Levy notes that P-O evaluation addressed two aspects: results and operations – both are essential in his view, since they are interdependent: lack of results could be due to lack of impact of the intervention or due to lack of implementation. P-O evaluations included quantitative and qualitative methods (the latter for attitudes, perceptions and non-quantifiable impacts) and covered multiple dimensions reflecting the various components of program (consumption/investment; health, nutrition, education, child labor); they had to account for interactions of components important in many cases (e.g., education and nutrition)**.** Randomized Control Trials (RCTs) were facilitated by P-O's phased approach, but (a) needed to be integrated into program design from start, (b) became more difficult over time, as control groups less readily available, (c) needed to take account of rural-urban differences in the modalities of survey gathering and sequencing; and (d) had to be done in an independent, transparent manner to ensure objective, credible results. Levy further highlighted the need to avoid "*evaluation capture*" (i.e., evaluators providing favorable evaluations to officials in return for some benefits). (p. 126/7)

Some important findings of the P-O evaluations included the following:

- Significant reduction in poverty head count, gap and severity were found, but no reduction in adult work effort due to cash payments.
- There were significant differences in impact: e.g., impact on household investment (and hence long-term impact in reducing poverty) depended on ownership of assets (asset-poor households did not invest).
- Additional benefits were demonstrated, including (a) P-O functioned as a safety net for income/relative price shocks; (b) local food demand/production was enhanced; (c) there was a positive impact on women's status inside their households.
- Evaluations also unearthed a number of implementation challenges: overload of health clinics; poor absorption of nutritional supplement, which led to change in supplement; limitations on distribution and consumption of nutritional supplements; higher enrollment reduced quality of education, given capacity constraints, and hence no major change in educational achievement occurred.
- Finally, evaluations flagged some unintended side-effects, including improved access by the poor to financial institutions and increased outmigration.

4. Conclusion

This concluding section covers three aspects: a brief consideration of the trajectory of P-O after 2005, the last year covered by Levy's analysis; Levy's summary of key elements contributing to the successful scaling up experience of P-O; and a summary assessment of the strength and weaknesses of the Progresa-Oportunidades approach as seen through the lens of the of Scaling Principles.

Trajectory of Progresa-Oportunidades after 2005

A full account of the development of P-O after 2005 is beyond the scope of this note. However, it is important for appreciating the sustainability and longevity of the program to note that in 2014 the program was still going strong. Having been renamed "Prospera" under President the Peña Nieto in 2013 and modified in a few important respects[9] – but without change in its core characteristics --, the program is reported to have reached 6.1 million households by the end of 2014. (Dávila Lárraga 2016) As noted by the World Bank by 2014 the conditional cash transfer model of the P-O program had been replicated in 52 countries, showing its tremendous scaling potential beyond Mexico. (Lamanna 2014) By 2020, replication had reached over 60 countries. (Parker and Vogel 2021)

While over the decades of P-O's and Prospera's implementation evaluations showed that short- to medium-term impacts on poverty, nutrition, health and education have been positive, recent research on the long-term impact of the early phases of Progresa also demonstrated that "[c]hildhood exposure improves women's outcomes in early adulthood, with increases in educational attainment, geographic mobility, labor market performance, and household living standards. For men, effects are smaller and more difficult to distinguish from spatial convergence." (Parker and Vogel 2021)

In 2019 Prospera was terminated under President López Obrador. In its stead a program of education grants was introduced that conditioned benefits on enrollment but not attendance. (Parker and Vogel 2021) According to Kidd (2019) this change reflects weakened political support in the country for programs that narrowly target subsidies to the poorest and allegations that Prospera suffered from intrusion of partisan politics, inefficiency and corruption. Levy (personal communication) attributes Prospera's demise primarily to the fact that the program was out of step with the political priorities of the new administration.

Core factors supporting the scaling up of Progresa-Oportunidades according to Levy

Levy concludes his account of the scaling experience of P-O by listing the ten most important factors that in his judgement contributed to the program's successful scale up. In brief, the ten key elements, together with the main scaling principles they link to, are as follows:

- A clear problem statement and how the program will address it (Principle 1)
- A clear vision regarding scope and duration of program (Principle 1)
- Identify and incorporate from the start core elements of the program that make a decisive contribution to continuity (political) (Principles 2, 4 and 5)
- Assure budgetary sustainability (Principles 4, 5, 6)
- Assure program compatibility with the broader poverty strategy and avoid program proliferation (Principles 4, 5)

[9] These changes demonstrate the scope of the program to adapt in line with evidence and needs. The changes involved the following: "The program has maintained its basic components, which have demonstrated results over time: nutrition, health and education. With *Prospera*, these components were strengthened, expanding the health supply to include more interventions and increasing attention to strategies such as early childhood development, ensuring that families living in poverty continue to invest in developing their children's human capital. Additionally, -- and this is the most innovative part -- the program has expanded activities to favor the social and productive inclusion of beneficiaries. To this end, *Prospera* promotes the linkage of beneficiaries with complementary social and productive programs, expands education services to youth through scholarships for vocational training and favors their access to formal employment through the National Employment Service. Additionally, it promotes financial inclusion through beneficiaries' increased access to savings, microcredit and insurance." (Lamanna, 2014)

- Ensure effective incentives for all government agencies tasked with implementation (Principle 6)
- Ensure effective incentives for government officials for efficient/effective implementation (Principle 6)
- Evaluation is essential (Principle 8)
- International agencies can support design, implementation, financing and continuity (but they should not make domestic coordination requirements worse) (Principle 3)
- Political leadership (Principle 3)

Summary assessment of the Progresa-Oportunidades scaling experience

There is a close alignment between Levy's analysis of the experience of P-O and the Scaling Principles developed by the Scaling Community of Practice. This is not surprising, since Levy's 2006 account, which was sponsored by the Wolfensohn Center at Brookings, was a major inspiration for the development of the approach to scaling by the Center's experts (see Hartmann and Linn 2008, Linn et al. 2010, Hartmann et al. 2013, Cooley and Linn 2014, Linn 2017). This work in turn was one of the sources for the development of the scaling principles by Kohl and Linn (2021) and hence for the Community's Scaling Principles.

This case study also allows a tentative assessment[10] of the scaling experience of P-O in terms of its strengths and weaknesses. It's strengths were many as reflected in the fact that a rating of its design and implementation on each of the principles would be highly positive. In terms of clarity of vision, selection of intervention, assessment of scalability and enabling or constraining systemic conditions, adaptability and sustainability, and use of evidence the P-O program was very effective, with impressive results to show in terms of poverty reduction impact, uptake by the target groups, longevity of the program and replication elsewhere in the developing world.

To the extent there were limitations they can be summarized as follows:

- Participation: P-O did not involve the beneficiaries of the program and their communities in a participatory process of defining the vision of the program and in program implementation. This can be explained in two ways: First, at the time of the design of the program and during the height of its implementation, there was much less emphasis on community and beneficiary participation and empowerment than there is today. second, the program did in fact incorporate beneficiary interests by its regular surveys of beneficiary perceptions and uptake and involved the extensive consultations with political representatives in Congress. Third, the nature of the program, which successfully reached 5 million poor people, did not allow direct participation of individuals and communities in a meaningful way while also supporting efficient delivery. This points to a potential tradeoff in scaling design – for programs that reach the scale of P-O, it may in practice be difficult to provide for direct participation.
- Sub-national government involvement: As noted by Levy (2006 and personal observation) the program in effect bypassed subnational governments in the design of the conditional grant scheme. However, subnational governments in Mexico carry important responsibilities for education and health service delivery and did not respond effectively to the need to create sufficient capacity for absorbing the substantial increases in utilization of health and education services that occurred as a result of the P-O program. In this sense an important systems constraint was not effectively dealt with under the program. Again, this points to an important tradeoff: in this case between an efficient delivery process insulated from potential political

[10] An in-depth evaluation of P-O is beyond the scope of this paper.

disruptions at the local level and a process that ensured buy-in and essential support for the program at the subnational level.

- Lack of integration with a broader social policy framework: As noted by Levy (2006), P-O was to be integrated with a national poverty reduction program, but this did not happen. With the resulting neglect of the broader social constraints prevailing in Mexico, and especially the prevalence of informality in the private sector and the labor market, the wider objectives of P-O beyond immediate poverty reduction, namely the absorption of the new generation of better educated and nourished young people in higher productivity jobs, did not in fact occur. These constraints and ways to overcome them were identified by Levy (2008) but were not subsequently addressed.
- Approach to evaluation: As noted in the text, the generation and use of evidence in scaling design and implementation under P-O was exemplary. It involved extensive local and international analytical capacity from academia and international institutions. Moreover, many of the stakeholders in Mexico were very open to be convinced by the quantitative and qualitative evidence generated under the program. These conditions – technical and absorptive capacity – may not always be taken for granted in other countries or contexts.

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Scaling a Biomass Fuel Program in Moldova:

The experience of scaling under a UNDP project in support of biomass fuel development in Moldova

1. Introduction

During 2015-2016 United Nations Development Program commissioned a study of scaling in four of its country programs (Bosnia and Herzegovina, Egypt, Moldova, and Tajikistan). The approach and results of this study are summarized in Begovic, Linn and Vrbensky (2017) and are reflected in its abstract as follows: *"The paper applied an operational framework consisting of six basic questions: (i) Is there a pathway to scale? (ii) What is the problem to be solved, the vision and target of scale? (iii) What ideas, innovations or models are to be scaled up? (iv) How can the enabling conditions (drivers and spaces) be put in place? (v) How about the sequencing of key steps? (vi) Does monitoring and evaluation support learning for scaling up? The paper concludes that many of UNDP's programs and projects pursue pathways to scale, but that overall a more systematic operational approach along the lines suggested in this paper would be desirable."*

This note summarizes the analysis for one particular UNDP-supported project, the "Energy and Biomass Program" in Moldova, by applying the lens of the eight scaling principles and twenty lessons developed by the Scaling Community of Practice to the analysis of scaling as reported in Linn (2016). This case example can only offer a snapshot of the program up to the time of the visit to Moldova by Linn in October 2015. The questions addressed in this original study overlap with those addressed by the Scaling Principles, but did address all the scaling aspects covered by the Principles. Hence, not all aspects of the Scaling Principles can be covered in this review.

2. UNDP's Energy and Biomass Project in Moldova: Overview

A brief description of the key elements of the UNDP's Energy and Biomass Project is provided in Linn (2016):

> *"UNDP's Moldova Energy and Biomass Program (MEBP) involves the processing and burning of biomass from agricultural residues for producing biogas to replace natural gas heating for use by households and small public facilities in rural areas. The program's first phase built on a study funded by Austria fifteen years ago, followed by a pilot funded by the World Bank and by a subsequent EU-funded study (which included an estimate of the potential scale for the program). Over four years (2011-2014) the first phase of the program developed a biogas market, a solid network of end users (including about 1000 households) and the start up of 120 new private biomass pellet producing businesses (35 with support of the project, the others spontaneously created), and supported the development by local entrepreneurs of assembly of imported equipment and of entirely locally created equipment.*
>
> *"The second phase (2015-2017) aims to improve the quality of the program, including the development of an effective system of control and certification of biofuel, further development of technology and of the capacity of local enterprises and a strengthening of the market. The program is also being extended geographically to Transnistria, Gagauzia and Taraclia. Extension of the program to cover agroforestry biomass (following the Swedish example of energy willows) will also be explored for potential industrial level use." (Linn 2021, p. 30)*

3. Applying the Principles and Lessons

Based on Linn (2016), this section assesses how the scaling principles and the relevant lessons under each principle apply to the scaling up approach used under UNDP's Energy and Biomass Project in Moldova.

A. What is the vision of scale?

Principle 1: Develop from the outset and in a participatory way a context-specific vision of the problem(s) that need(s) to be addressed and the expected pathway and impact of interventions at optimal and sustainable scale.

Relevant for Principle 1, Linn (2016) addresses the following question and provides the corresponding answer for this project:

"What is the problem that UNDP has been addressing and at what scale? The project aims to convert previously unused agricultural waste into energy for home and public office heating, and thus to increase energy efficiency and reliance on renewable energy, while reducing dependence on energy imports, and especially on (potentially unreliable) imports of gas from Russia via Ukraine. The program has drawn on and commissioned various studies of biomass capacity to establish the potential scale of biomass supply for energy production in Moldova. From the available documentation it is not clear what analysis was carried out to determine the potential scale of biomass energy use in households, public buildings and possibly commercial energy users or whether an ultimate goal has been established for how much of available biomass supply could be converted into usable renewable energy. (p. 31-32)"

This allows the following conclusions for the three lessons under Principle 1.

Lessons

Begin with the end in mind: The Moldova biomass program was designed with the scaling objective in mind, but did not fully analyze the scale potential or specify a vision of the ultimate scale goal for the initiative beyond the end of the project. By building on the experience with previous initiatives in the biomass energy area, the project design involves a scaling approach going forward. To what extent the earlier initiatives already envisaged a scaling pathway is not clear from the available information. The problem with not defining the end up front is that the ad hoc step-by-step approach it may result in business models, financing practices, incentive structures, etc. that ultimately are not helping to reach sustainable scale.

Aim for optimal, not maximum scale: In the absence of a well-articulated scale goal, it is not possible to determine what would be maximum versus optimal scale.

Form the scaling vision in a participatory way: The program was designed in many ways with strong participatory and outreach practices, involving government agencies, local authorities, private sector actors, innovators (through competitive pilots) and assessment of farmer and user readiness to participate in the program. (See Principle #6 and footnote 3 below) However, it does not appear that farming communities were empowered to engage directly in the design, implementation and evaluation of the program.

B. What to scale?

Principle 2: Define the core elements of the intervention (or intervention package) to be scaled and assess whether it can be sustainably scaled in a particular context.

Relevant for Principle 2, Linn (2016) addresses the following question and provides the corresponding answer for this project:

"What were the interventions supported by UNDP? The program involved a comprehensive and highly complementary set of interventions on the demand and supply side of market development. On the supply side the program focused on supply chain development, involving farmers providing the biomass, biofuel pellet producing firms and firms that imported, assembled parts for, and ultimately locally produced the boilers that convert biomass into heat and/or energy. Technical innovation was encouraged through competitions. Alternative technical solutions were systematically studied and tested. On the demand side the program involved the identification of interested households and public agencies, outreach to communities, and educational and mass media campaigns and created demand with the provision of substantial subsidies for the purchase of boilers. The program also focused on the development of market supportive policies and institutions, including the establishment of the Energy Efficiency Agency during the first phase and the Biofuel Quality Assurance Center during the second phase, and capacity building for all key actors through training and knowledge sharing. (p. 32)

"During implementation, new ideas and initiatives (e.g., cogeneration or heat and power, private-public partnerships, inter-municipal cooperation and educational materials) were developed and piloted, for eventual replication and scaling up… In addition, the scaling up process involved multiple dimensions: horizontal scaling up through extension of the program to additional beneficiaries and jurisdictions; vertical scaling up by addressing policy and regulatory issues; and functional scaling up by expanding the program to technical solutions and fuels beyond the initial approach." (p. 31)

The decision of what to scale involves two specific lessons under Principle 2.

Lessons

Focus on core elements of an innovation: The Moldova biomass project appropriately considered both supply and demand side conditions for scaling, allowed for development of suitable innovations and their testing with a systematic, competition based approach, and incorporated key institutional elements it project design. Linn (2016) cautioned against overloading the project with too many new interventions.

***Assess scalability*:** The project design and implementation considered many of the potential enabling factors for scaling, esp. the enabling conditions (Linn 2016, p. 36; also see below), but did not apply a systematic scalability assessment.

C. Who will scale?

Principle 3: Identify, engage and coordinate leaders, champions, intermediaries, partners and public/private actors to fill key roles in driving, funding and implementing scaling.

Going to scale rarely happens spontaneously or by itself. Four principal lessons show that four sets of actors – mostly organizations, but also individuals – need to engage and cooperate in scaling, with potentially changing roles over the scaling process:

Lessons

Find and convince leaders: There were two centers of leadership for this project: the national authorities and UNDP. National leadership was described by Linn (2016) as follows:

"The program benefitted from clear political commitment to energy efficiency and self-reliance in the face of uncertainties of external energy supplies. The Ministry of Economy and, after its establishment

with UNDP support, the Energy Efficiency Agency have been important drivers of the scaling up process. As the program got established, the businesses, jurisdictions and communities involved also became drivers for sustainability and scaling up." (p. 32)

***Identify and empower one or more intermediaries**:* UNDP played an important leadership and intermediary role during the project implementation, with the newly created Energy Efficiency Agency tasked to grow into this function over time.

Create and leverage partnerships. Partnership played an important role in the project according to Linn (2016):

"Developing appropriate partnerships is critical for scaling up. The biomass program appears to have paid close attention to this aspect, both in its partnership with domestic partners at the national and local level, including also community level partners.[11] The program also had a strong partnership with the EU and good "peripheral vision", in picking up on initiatives and pilots supported by other donors. Finally, links with other projects in UNDP's portfolio appear to have been constructive and developing useful synergies, including with other projects in the energy portfolio, as well as with the JILDP and the Confidence Building Program for Transnistria." (p. 35)

Ensure that public action and private action are consistent and mutually reinforcing: This lesson is demonstrated well in this project, as both public and private sector actors had to be involved throughout the value chain from equipment provider to biomass producing farmer to final energy user (see footnote 13 below).

D. How to plan for scaling?

Principle 4: From the outset, identify systemic opportunities, constraints and risks; plan to align with them or address them through system change along the scaling pathway.

Understanding and addressing systemic opportunities, constraints and risks was critical for the scaling up process of the Moldova biomass project as illustrated with reference to the following three lessons.

Lessons

Map and address systemic enabling factors: While not engaging in a formal systems-mapping process in preparing and implementing P-O, the Moldovan authorities and UNDP paid special attention to the following systemic constraints, in addition to budgetary constraints (see next lesson):

Political constraints: According to Linn (2016) considerable attention was given to political space:

"The program contains a strong outreach and communications component. Based on an explicit stakeholder analysis key actors whose support was needed were identified, and outreach, training, school curricula and media campaigns were designed and implemented accordingly. As with the rest of the program, in many cases initiatives were implemented on a pilot basis, their impact and effectiveness assessed and they were then rolled out at a larger scale (e.g., curricula for schools). One aspect that was

[11] Footnote from Linn (2016): "The final independent evaluation of the first phase of the program concluded: 'The implementation approach of the Project has been highly strategic in close collaborative working relationships with national-level government institutions (in particular the project partner, Ministry of Economy, other line ministries and the Energy Efficiency Agency) and in participatory manner with regional and local administrative authorities and in close cooperation with stakeholders from private sector (suppliers of biofuels and of heating equipment), funding facilities, universities and educational institutions and NGOs.'

perhaps not as explicitly covered in the stakeholder analysis, as might have been desirable, was an analysis of losers, if any, from the program and of their ability to raise political roadblocks." (p. 33)

Policy constraints: The project focused squarely on key policy (including legal and regulatory) aspects of the energy sector that needed to be addressed to ensure effective development of biomass energy. However, as explained by Linn (2016) one key policy element did not get adequate consideration relevant to sustainable scaling, namely the cost structure of biomass production in relation to the cost of alternative energy sources:

"Overall, the existence of a national energy strategy and a commitment by the government to energy efficiency and self-reliance and to renewable energy helped create a favorable policy environment. Moreover, the program was cognizant of the policy and regulatory constraints and appears to have tried to address them explicitly in its engagement with the Ministry of Economy and other ministries. However, a key question for the sustainability and scalability of the program is how the cost of biomass energy for the end user compares to the cost of alternative energy sources, and especially natural gas. Historically, the low cost of natural gas in the immediate post-Soviet times reinforced the traditional reliance of the population on natural gas and created barriers to introducing alternatives, including renewables. In recent years natural gas import prices had increased substantially and with it also prices for domestic users. This had helped the acceptance of biomass energy, but even then significant subsidies were required to change established practices. However, in the most recent months natural gas import prices (from Russia) dropped due to global energy price trends and Russian pricing policies, which undermined the demand for biomass energy. The program therefore faces new potential barriers. The project documents give no indication that (or how) this important price variable, which to some extent is a matter of domestic energy policy, has been factored into the sustainability and scalability considerations of the biomass program. This deserves further attention [and the analysis of the issue in this paragraph needs to be checked to make sure it reflects facts on the ground accurately]." (p. 33/34)

Institutional constraints: Institutional issues were at the center of project design with a view to long-term sustainable scaling (Linn 2016):

"The biomass program paid considerable attention to the institutional framework and the capacity of institutions. The Energy Efficiency Agency (EEA) was set up five years ago under the program, along with the Energy Efficiency Fund (EEF). EEF is EEA's mechanism to channel grants and subsidies to firms and households. Very importantly, EEA/EEF are expected to manage/fund the program after the UNDP second-phase project ends in 2017. Moreover, under the second phase of the program, a Quality Assurance Center is to be set up to assure sustained quality improvements in the system, which will be critical for the scaling up agenda. Also, the UNDP program provides intensive training to managers of firms involved in the biomass value chain, as well as to local government and community leaders and staff to ensure that their capacity for accepting and managing their respective program components is enhanced and for sustainability and scalability. Finally, the program uses the National Implementation Modality (NIM), which is a further factor in helping assure the development of national implementation capacity." (p. 34)

Cultural, social, and environmental constraints: The project paid attention to these constraints as noted by Linn (2016):

"The program was designed with the recognition that longstanding cultural obstacles had to be addressed in terms of the population's expectation of cheap natural gas supplies for household use and hence the resistance to switching to an unfamiliar biofuel energy source.[12] The combination of subsidies

[12] This obstacle was also stressed in the final evaluation of the first phase of the program (p. 10).

and active outreach helped address this obstacle. The project also stressed the importance of involving women and young people as beneficiaries and supporters in the program.

"The Project Document for Phase 1 of the program demonstrated a recognition that the impact on soil quality when scaling up the withdrawal of agricultural waste needs to be studied. It also noted that the emissions of the biomass energy project would have to be studied and assessed. The Project Document for Phase 2 makes no reference to these environmental aspects, so it could not be ascertained how significant these effects (soil and emissions impacts) will be for a scaled up program. This deserves further attention." (p. 35)

Pay special attention to financing and cost constraints: Budgetary constraints are at the center of long-term sustainability of this project, as the subsidy scheme on which it is build requires long-term financing. While this issue was under consideration during project implementation, it is clear from Linn (2016) that this challenge had not yet been resolved:

"Many donor-supported projects ultimately fail in terms of sustainability and scalability, because there is no financing available after the external donor withdraws. Both phases of the biomass program have been financially supported by the EU (and to a much lesser extent by UNDP resources). In the absence of continued and increasing EU funding, the program ultimately will either have to phase out subsidies or rely on the government budget, if it is to be sustainable and scalable. According to the head of EEA during the interview, some [budgetary] financing for the EEF was assured by governmental decision in October 2015. This sets a useful precedent. Additional financing options are the climate financing facilities that have been set up in recent years and may be further enhanced at the Paris COP21. If the PPPs to be explored under Phase 2 turn out to be successful and scalable, this too could be a financing source." (p. 34)

Assess and address risks: Linn (2016) notes that the official project documents for this project contain explicit risk sections which highlight key risks of project implementation. From a scaling perspective, Linn identifies the following risks in particular:

- Maintenance of national ownership of the program;
- Excessive expansion of scope of interventions by expanding into other biofuels;
- Limited institutional strength of key agencies;
- Gas price risks (substantial drop in price of imported gas could undermine biofuel strategy);
- Financial sustainability with uncertainty of continued EU financing and of potential budgetary support.

Principle 5: Develop in a participatory way a scaling strategy and implementation pathway(s) to achieve the sustainable scaling vision.

This principle is paired with the following lesson:

Lesson

Link the vision with the innovation by developing a strategic and sustainable scaling pathway*:*
Although the Moldova biomass project did not have a clear vision of scale, it had some strengths in the design of the pathway towards scale in terms of its treatment of pilots, horizontal versus vertical versus functional scaling, and project sequencing, as noted by Linn (2016):

"Pilots: [T]he program initiated a number of pilots since its start-up. It appears that these pilots were well prepared, monitored and evaluated and where appropriately scaled up, although a full assessment goes beyond the scope of this study. The completion report for the first phase does report on two pilots (cogeneration and PPP pilots), but it does not indicate whether a formal evaluation of impact,

sustainability and scalability was carried out. It is notable that the project used pilots and competitions to explore the effectiveness of alternative technical and organizational approaches to biofuel market development.

"Vertical versus horizontal versus functional scaling up: The biomass energy program has rightly combined horizontal and vertical scaling up. By linking the program to the national energy strategy, by supporting the creation of national-level institutions with responsibility for key aspects of the scaling up process…, and by helping to establish the legal and regulatory framework for the biomass energy markets, the program created the necessary vertical scaling up conditions needed to allow the horizontal scaling up process to take place at the local level. At the same time, the program also began to explore functional scaling up by broadening the possible biofuel sources. A key question that will have to be addressed here is what are the possible complementarities and tradeoffs between horizontal and functional scaling up: On the one hand, branching into other biofuel sources may allow a wider reach for the program in terms of beneficiaries and bioenergy use, on the other hand, it may limit the sustainability and scaling up pace of the original biofuel usage, if limited institutional capacity and funding are spread too thinly.

"Project sequencing: One of the great strengths of UNDP's engagement in the biomass energy program has been the systematic sequencing of its project engagement, with the first phase building on a prior study and pilot implemented by other external donors, as noted above. Moreover, by sticking with the program over two successive project cycles UNDP has been able to deepen its engagement and extend the reach of the program functionally. The second phase built on the experience and achievements of the preceding phase. One of the questions UNDP and its partners should begin to address already during the implementation of the second phase is whether there is an expectation for continued UNDP (and EU) engagement beyond the end of Phase 2 (2017). A decision on when and how to hand off to others (other donors and/or national agencies) is a key parameter that will determine the sustainability and continued scaling up pathway of the program." (p. 37)

E. How to implement scaling?

Principle 6: In line with the scaling strategy, mobilize resources and institutional capacity and create demand for the scaling initiative by aligning incentives and pursuing advocacy to enlist stakeholders and change attitudes, mindsets and social norms.

Lessons

The Moldova biomass project program demonstrates key aspects of Principle 6 as reflected in the following three lessons:

Mobilize resources and institutional capacity for scaling and for sustained implementation at scale. The program paid attention to building an effective and sustainable institutional capacity, as noted above.

Pay attention not only to the supply side of the scaling process, but also the demand side**:** The program was designed with a clear demand-side perspective.[13]

[13] See this quote from Begovic et al. (2017, p. 12) for the Moldova biomass program: "The program involved a comprehensive and highly complementary set of interventions on the demand and supply side of market development. On the supply side the program focused on supply chain development, involving farmers providing the biomass, biofuel pellet producing firms and firms that imported, assembled parts for, and ultimately locally

Align interests and generate incentives: The program was squarely focused on ensuring effective information, and incentives were provided for farmers and users through the subsidy program and outreach and communication efforts. As noted, the design of the subsidy system did not sufficiently address the gas price risk.

Communicate and advocate based on evidence: The program involved a strong communication program for farmers and users, including introduction of "green curricula" in schools (see footnote 3 below).

Principle 7: Iterate, learn, adapt and sustain the scaling pathway as long as needed.

Experience shows that readiness to iterate, learn and sustain the scaling pathway over the long haul is a critical part of successful scaling. The Moldova project overall did well in this regard, but needed to develop a stronger approach to financial sustainability.

Lessons

Iterate, learn, adapt: As noted earlier implementation of the program was intensively monitored and evaluated, including pilot projects as well as the overall program execution, with largely appropriate measures taken to adapt the program in light of lessons learned. (See also Principle 8 below.)

Focus on sustainability: There was some attention to sustainability in the political, institutional, financial, cultural and environmental dimensions, but as noted earlier in many of these areas there were risks to sustainable scalability which remained to be fully addressed going forward.

Maintain a long-term perspective: UNDP demonstrated a welcome capacity to "stick with it", by providing support over two successive project cycles and by focusing on key enabling factors that would underpin sustainability, including creating the political, policy, institutional sustainability as noted above. However, in the absence of a longer-term scaling vision and pathway it is not clear whether and how far ahead beyond project end UNDP was looking. In particular, there is no indication that in 2015 the UNDP project team was explicitly considering what would happen after the end of the second-phase project.

F. Based on what evidence?

Principle #8: Base all scaling decisions on relevant evidence and continuous learning.

Lesson

<u>*Collect and apply evidence throughout*</u>. According to Linn (2016) the Moldova biomass project performed well overall on this criterion, although the scaling aspects could have been more systematically integrated into the monitoring and evaluation approaches and the results framework of the project:

produced the boilers that convert biomass into heat and/or energy. Technical innovation was encouraged through competitions. Alternative technical solutions were systematically studied and tested. On the demand side the program involved the identification of interested households and public agencies, outreach to communities, and educational and mass media campaigns and created demand with the provision of substantial subsidies for the purchase of boilers. The program also focused on the development of market supportive policies and institutions and capacity building for all key actors through training and knowledge sharing."

"In general, the available documentation on the project and the interviews indicate that the project has been designed with an explicit focus on the innovation-learning-scaling up cycle, as noted above. Throughout, active learning of what worked and what didn't work, and what lessons could be drawn from pilots and from various aspects of the program, appears to have been a key component of the approach adopted by UNDP and its partners. An independent evaluation was carried out for the first phase of the program in 2014. It concluded that the project was overall successful in terms of relevance, effectiveness, efficiency and sustainability, and recommended continued engagement with a follow-up phase. It drew specific lessons and proposed recommendations. To what extent the program's M&E processes have addressed specifically the scaling up dimensions of the project is difficult to say, although the final evaluation of phase 1 has a brief assessment of replicability (p. 47), which reports on the fact that in one jurisdiction (Boghiceni) the local administration on its own initiative replicated the biomass activities beyond the program scope. This is indeed a welcome indication of the spontaneous replicability of the program, but does not amount to a systematic scalability evaluation or assessment. However, the detailed analysis of sustainability, which can also be found in the final evaluation, confirms some of the factors analyzed in the section on drivers and spaces above (esp. institutional and technical capacity constraints, financial challenges, and socio-political and awareness factors).

"The results frameworks presented in the project documents provide useful benchmarks and metrics for measuring progress in project implementation. However, if one wishes to monitor and evaluate project impact in terms of scaling up, it is necessary to explicitly define the outcome metrics in relation to an ultimate scale target. This is generally not done in the results frameworks for the biomass energy program. Most output measures are expressed as absolute numbers (i.e., so many districts, towns and communities covered, so many households reached, so many firms and jobs, and so many people trained), without giving a sense of how significant these numbers are relative to a well-defined longer-term scale goal. Even where results metrics are stated in terms of percentages of some total or as percentage changes from a baseline, it is generally not clear what they mean relative to an appropriate scale goal." (p. 37)

4. Conclusion

This concluding section covers two aspects: Linn's (2016) recommendations for the future development of the scaling of the Moldova biomass program and a summary assessment of whether and how the experience with the Moldova program, as interpreted by Linn (2016) confirms the scaling principles and lessons promoted by the Scaling Community of Practice.

Recommendations for the continued scaling of the Moldova biomass program

Linn (2016) praised the Moldova biomass project for its overall strong and effective focus on scaling, but also recommended a number of actions to continue or further strengthen the scaling aspects of the program, which can be mapped directly into the Scaling Principles:

i. *"Maintain the long-term perspective and "stick-with-it" approach.* [Principles 1 and 7]
ii. *"More clearly define the scale goals of the overall program and for specific program activities and initiatives and explore ex ante how project design and implementation affects scalability.* [Principles 1 and 2]
iii. *"In exploring functional scaling up (e.g., to new sources of biofuel), carefully assess whether the implementation capacity of the responsible institutions (including UNDP) is up to the task, without diluting the implementation efficacy for the core program.* [Principles 2, 3 and 4]
iv. *"Actively look for champions among influential opinion and policy makers.* [Principle 3]

v. *"Continue with institutional capacity building, since much of the work has only gone partway towards the impact and scale needed; and ensure UNDP has adequate capacity to support the program.* [Principle 4]

vi. *"A detailed assessment of the natural gas import price prospects and of an appropriate policy framework for domestic gas pricing would be a high priority aspect in ensuring a supportive policy space.* [Principle 4]

vii. *"The financial/fiscal sustainability and scalability of the biomass energy remains a significant challenge that has yet to be addressed, in particular as regards the continued financing of subsidies and grants beyond the UNDP/EU-supported program cycle. New global climate finance instruments may be a potential source for grant financing.* [Principle 4]

viii. *"In the partnership space, explore the extent to which government financial participation can be strengthened.* [Principle 3 and 4]

ix. *"Review the process by which pilots are evaluated and whether it is sufficiently rigorous in terms of impact and scalability assessment.* [Principle 8]

x. *"More generally, scalability of projects and program components, whether pilots or not, should be systematically assessed and to the extent possible and appropriate, scaling up pathways explored. [*Principles 2 and 5]

xi. *"Monitoring and evaluation should focus on the key dimensions of scaling up, possibly in line with the framework adopted here. A good time for a comprehensive scaling up assessment of an ongoing project is the mid-term review."* [Principle 8]

Summary assessment of Moldova biomass project scaling experience

Based on Linn (2016] the above assessment shows that the experience of the Moldova biomass projects can be analyzed and assessed by applying the lens of the scaling principles developed by the Scaling Community of Practice. This was facilitated by the fact that is the Linn (2016) analysis of the program was based on the general approach developed by the Wolfensohn Center at Brookings, in cooperation with IFAD (see Hartmann and Linn 2008, Linn et al. 2010, Hartmann et al. 2013, Cooley and Linn 2014, Linn 2017). This work in turn was one of the sources for the development of the Scaling.

Considered through the lens of the Scaling Principles the Moldova biomass project had a number of significant strengths, including it effective sequencing of projects, good domestic leadership, the continuing engagement of UNDP as an effective intermediary, attention to the demand side of the scaling process and to cultural and social factors, to building institutional capacity and to leveraging partnerships, and a willingness to learn and adapt. However, the scaling approach also missed certain key elements:

- No clear vision of the scaling goal and hence also no clear focus on what is optimal scale;
- No participatory approach at the community or farmer level;
- Insufficient consideration of a key policy constraint, viz. the price of alternative energy sources;
- Insufficient attention to potential environmental impact of the project;
- Potential lack of sustainability of the subsidy model as the scaling process continued and for operation at scale; and
- No clear focus on scalability in monitoring and evaluation.

These limitations are not surprising since UNDP did not have a systematic institution-wide approach to scaling in ins operational policies and hence it was left to individual project managers to develop projects with or without an explicit and systematic focus on scaling.

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Scaling the collection and sharing of weather observation for resilient development and climate action:

Application of eight scaling principles of the Scaling Community of Practice to the establishment of the Systematic Observations Financing Facility (SOFF)

1. Introduction

This case study reviews the experience with the preparation of the Systematic Observations Financing Facility (SOFF), an initiative that aims to improve the collection and sharing of weather and climate observations in Least Developed Countries and Small Island Developing States with the goal to improve global weather and climate prediction globally and in the direct beneficiary countries.

The case study differs from the two previous ones in four regards:

i. It is prospective, in the sense that the initiative which it assesses, the, is only reaching the end of its preparation phase with implementation about to begin at the time of the assessment, rather than having completed or being in progress. Therefore, the study can only assess to what extent the preparation of the initiative is in line with the Scaling Principles or diverges significantly from it. It cannot evaluate the actual implementation of the initiative and judge whether and how meeting the principles or not influences the ultimate outcome of the scaling process.

ii. The initiative is not a freestanding intervention that is to be scaled up, but an effort to improve an existing system, the global weather and climate analysis and prediction system, in a very specific and targeted manner over a period of ten years. All interventions, including those covered in the previous two case studies, are embedded in an ecosystem that provides for opportunities and constraints. What is different in this case is that the system within which the intervention takes place does not simply determine the enabling or constraining factors, but it is at the core of the vision of scale: Improving the way the entire system functions at a global level is the scale goal.

iii. In this case study the author serves not an outside analyst who applies the principles in an arm's length manner, but he has been and remains deeply engaged in the preparation of this initiative in his capacity as "SOFF Global Facilitator," and thus functions as a participant observer rather than as an independent evaluator.[14] This has the advantage of being close to and well informed about the process, but suffers from the obvious limitation of potential bias.[15] It should also be noted that although the author has been working on scaling methodology and practice over the last fifteen years, he did not apply the scaling methodology consciously and systematically during his engagement with this initiative. In that sense. The realization that this case is in fact a scaling exercise only became to him apparent gradually during the course of his engagement. So while the author's familiarity with scaling and its requirements may have helped him guide the preparation, he did not systematically apply the principles ex ante.

iv. The approach in this case study was different from the of the previous two, in that the author chose not to focus the assessment on the individual lessons under each principle, but rather on the principle as a whole. This was done with the intention of offering the reader an alternative format

[14] This is a position similar to that of Santiago Levy in his assessment of Progresa-Oportunidades, which is the source of information of the first case study in this paper.

[15] This bias is common to all self-evaluations, which are now standard practice as an input to independent external evaluations.

to choose in designing subsequent case studies. The advantage of the more disaggregated format is that it allows a more systematic and in-depth assessment of the various component parts of each principle; the alternative pursued in this case has the advantage of maintaining a clearer high-level focus on the eight principles. Which of these approaches is to be preferred will depend on the case at hand and on the purpose and audience of the case study.

2. Background on SOFF

Ground-based weather observations are a critical input to global, regional, national and local weather and climate prediction. For accurate forecasts of weather more than three days ahead anywhere on the globe, weather prediction models need to draw on information on weather conditions from all around the globe. Furthermore, climate trend and impact analysis depends critically on accurate and complete current global weather and climate conditions. The collection and international sharing of local weather and climate data is therefore a global public good. There are however large gaps in weather observations in many parts of the world, especially in the Least Developed Countries (LDCs) and in the Small Island Developing States (SIDS). These gaps occur either because data are not collected locally, or data that are collected are not internationally shared with the global weather and climate prediction centers. The resulting reduction in the quality of weather and climate prediction undermines the effectiveness of development and climate action and results in significant economic and social losses.[16]

In 2019 the 193 members of the World Meteorological Organization (WMO) agreed to a common minimum standard for the most essential ground-based weather observations collection and sharing (referred to as "GBON – the Global Basic Observing Network") by all countries. However, it was recognized that LDCs and SIDS are severely constrained in terms of capacity, resources and incentives for achieving and sustaining GBON compliance. Therefore, the Alliance for Hydromet Development – a group of 14 multilateral development finance agencies, including UN agencies and multilateral development banks – proposed the establishment of the Systematic Observations Financing Facility (SOFF). According to the SOFF Terms of Reference, SOFF has the following main characteristics:[17]

- *"A global initiative to address a persistent problem in a global and systematic manner – i.e., missing surface-based weather and climate observations from developing countries.*
- *"An initiative with an exclusive focus on the initial part of the meteorological value chain that creates the foundation for effective weather and climate information services.*
- *"A dedicated financing mechanism that provides grants and technical assistance, with a focus on LDCs and SIDS, to enable sustained compliance with the GBON regulations.*
- *"A mechanism that is built on peer-to-peer collaboration and support among national meteorological services, harnessing their operational experience as providers of peer technical advice.*
- *A commitment of the Alliance for Hydromet Development, supported by beneficiary countries and multiple stakeholders."*

SOFF is designed as a pass-through financing entity, to be funded on a voluntary basis primarily by bilateral official donors and relying on implementing entities (UNDP, UNEP, WFP and the Multilateral Development Banks – MDBs) to incorporate observation components funded by SOFF into their more comprehensive projects dealing with weather and climate impacts on countries and their populations.

[16] For information on all aspects of the SOFF initiative covered in this case study, see WMO, UNDP and UNEP (2021).
[17] Verbatim quote from op. cit., p. 29.

The estimated annual benefits of full GBON compliance by LDCs and SIDS due to better weather prediction are about USD 5 billion, the estimated costs are about USD 400 million over a five-year implementation period and USD 50 million annually in O&M finance to sustain compliance beyond the first five years,[18] with a cost-benefit ratio of about 1:25.

The preparation of SOFF involved an intensive two year process spearheaded by WMO in close collaboration with its partners in the Alliance for Hydromet Development. The three founding UN agencies, WMO, UNDP and UNEP, signed a memorandum of understanding in November 2021 creating SOFF and SOFF operations are expected to start in July 2022, once a first tranche of donor funding has been secured. The preparation process and the resulting SOFF initiative represents an example of a scaling effort. This note considers how this process stacks up in terms of the scaling principles and lessons compiled of the Scaling Community of Practice. Of course, the scaling pathway will have to continue beyond the preparatory phase now nearing completion and much remains to be done to achieve the vision of full implementation of GBON compliance.

3. Applying the Principles and Lessons

A. What is the vision of scale?

Principle 1: Develop from the outset and in a participatory way a context-specific vision of the problem(s) that need(s) to be addressed and the expected pathway and impact of interventions at optimal and sustainable scale.

The vision of SOFF is clearly establish: an outcome of sustained GBON compliance for LDCs and SIDS to be achieved over a 10 year period.

SOFF is guided by the GBON regulations. They are a set of internationally agreed resolution and frequency standards for international exchange of observations. The design of these requirements responds to several decades of research the Numerical Weather Prediction, the primary tool of global weather prediction. Thus, GBON regulations respond to an optimal global design and scale that was developed and decided on in a shared and inclusive manner by 193 states and territories Members of the World Meteorological Congress).

The SOFF vision is shared by the members of WMO (as represented by the national meteorological organizations) and by the partners of the Alliance for Hydromet Development, based on a joint preparation process involving five working groups over two years. The vision has also been widely disseminated and discussed with potential funders and other stakeholders, including recipient country governments, with private sector representatives and civil society organizations.

A pathway, or theory of change, has been elaborated, linking operational inputs in three phases (preparedness, investment and compliance) to outputs and outcomes, and to the long term goal of improved climate and weather services.

The expected pathway consists of three sequential periods: a 6-month start-up period, a three year first implementation period, and a seven year expansion and sustaining period. A results framework has been established for the first implementation period, which is seen as a learning and adaptation stage.

SOFF is not focused on maximizing its expected coverage of all countries or even all developing countries, but on supporting LDCs and SIDS, on the grounds that these are the countries least able and

[18] The implementation horizon was adjusted to 10 years since these cost estimates were prepared, with $200 million required for the first three years of implementation (see op.cit.).

ready to implement GBON, most in need of grant assistance to improve the foundational weather and climate services, and most exposed to climate risks. The limitation in scope is also based on an explicit consideration of costs of upgrading observation stations and sustaining their operation, and on an assessment of the willingness of official funders to support middle income countries with grant finance. However, acknowledging the importance of observations from all over the world and their immense value as a global public good, SOFF dedicates a limited share of its funding to technical assistance for non LDCs and SIDS developing countries. In many non- LDC/SIDS developing countries targeted technical assistance has the potential for rapid gains in achieving GBON compliance, supported where necessary by investment from multilateral or bilateral partners.

The governance structure of SOFF is designed for representation by all major stakeholder groups as part of the Steering Group (esp. funders and co-founders) and Advisory Board (all other main stakeholder groups); they will participate in ongoing decisions involving SOFF strategy, implementation and evaluation.

B. What to scale?

Principle 2: Define the core elements of the intervention (or intervention package) to be scaled and assess whether it can be sustainably scaled in a particular context.

The technology of weather observations and data sharing is relatively simple (using ground based and radio-sonde weather measurement equipment). The innovative and more complex aspects of SOFF are found in the following aspects:

SOFF as a unique facility that provides long-term financing beyond traditional project cycles in recognition that (i) the collection and sharing observations represents a global public good, and (ii) it would be unrealistic to expect of SIDS and LDCs to cover O&M costs of their observing network after an investment project ends.

An agreed global weather observation framework (GBON) designed for the optimal operation of global weather and climate models. The GBON design goes beyond purely country-driven approaches for design of observing networks, as this approach does not respond to the global nature of weather and climate.

The process of preparing for in-country investments. This involves the application of a carefully designed and tested Country Hydromet Diagnostics tool).

The process of peer-to-peer advisory services provided by the more advanced meteorological service organizations to their counterparts in LDCs and SIDS (the Country Support Initiative); and

the results-based grant finance method designed to cover 75 percent of O&M costs in LDCs and SIDS for the observations stations that regularly share observation data. This is based on a simple monitoring framework that allows WMO (as the technical authority of GBON/SOFF) to verify in real time that national observation data are actually shared globally.

SOFF focuses on the most essential weather and climate data (GBON) as a first step. The successful implementation of GBON in SIDS and LDCs through SOFF will inform discussions for a potential for scalability and expansion of SOFF and GBON (through the World Meteorological Congress) to other domains of earth and climate monitoring. CO_2 and marine observations for example, are also critical for climate and sustainable development and would be the potential next set of observations to be supported through SOFF, once WMO Members adopt observing standards for those domains. Thus, one of the potential forms of SOFF scalability could be SOFF becoming the financing mechanism for the most

essential weather and climate systematic observations (beyond GBON observations). The UNFCCC advisory body SBSTA, already recognized SOFF in 2021 as a means to support systematic observation under the Convention and the Paris Agreement.

While not based on a formal scalability assessment, the preparation of SOFF involved a careful and in-depth process of assessment of needs, priorities, costs and benefits, feasibility, likely funder support, etc., all with a view as to whether and how the initiative could reach an appropriate sustainable scale.

During the preparation process various initial design elements of the initiative where adjusted (e.g., moving from a one-off five year implementation period to a three-period phased implementation approach). Further adaptation in the approach is expected as needed, based on ongoing monitoring by the SOFF Steering Committee and the Advisory Board, supported by an external evaluation during the second and third year of the first implementation period.

C. Who will scale?

Principle 3: Identify, engage and coordinate leaders, champions, intermediaries, partners and public/private actors to fill key roles in driving, funding and implementing scaling.

Leaders: The Alliance for Hydromet Development and its members were the initial promoters and developers of the Facility and will also act as Implementing Agencies and Advisory Board members. This will help ensure their continued commitment and involvement in the implementation and success of the Facility. SOFF preparation was driven by the management of WMO, who effectively marshalled the diverse capabilities of a small team, including WMO staff and experienced outside consultants. UNDP and UNEP joined WMO as co-founders during the later stages of the preparation process.

For the future, the WMO, UNDP and UNEP leadership will have to remain strongly supportive to support the scaling pathway envisaged for SOFF. The SOFF Steering Committee and Advisory Board, supported by the SOFF Secretariat, create a participatory space to promote ownership and leadership from key institutions and stakeholders in shaping SOFF decisions and their implementation, anchored in and consistent with the climate intergovernmental process and key global climate finance and adaptation decisions, beyond the WMO Membership.

Intermediaries: SOFF as an institution is an intermediary, since its role will be to drive the scaling process forward with its technical, financial and knowledge resources, support coordination and ensure coordination across the many actors that have to cooperate at the national and international levels to assure effective delivery of ground based observations. SOFF's ability to play this role on a sustained basis will depend critically on its ability to raise the required donor resources.

Partners: Partnerships have been a core ingredient of SOFF from the start and will remain so in future. SOFF is an initiative of the Alliance for Hydromet Development, whose members will remain engaged as implementing entities and as members of the Advisory Board. Among the Alliance members, WMO, UNDP and UNEP will form an especially close partnership as co-founders, with WMO hosting the SOFF Secretariat and co-chairing the SOFF Steering Committee, while UNDP and UNEP will serve as co-chairs of the Advisory Board and participate in meetings of the Steering Committee. Partnership with the meteorological organizations that will provide peer advisory support will be a critical ingredient of the implementation of SOFF; and these organizations have been involved in the preparation of the SOFF, including in a pilot for the preparation of the Country Hydromet Diagnostics in 2021. Partnership with the recipient countries will be essential to ensure ownership of SOFF implementation at the country level. Here much will depend on the effectiveness of the Implementing Entities in ensuring effective delivery that respects the participation and ownership of the national stakeholders.

Public and private actors: The national meteorological centers as public sector agencies are the main national implementing agents. However, implementation will also include a business model allowing private sector involvement. Therefore, the preparation process engaged key private sector actors – the equipment supplier association and an insurance industry association, which will also serve on the SOFF Advisory Board. Moreover, consultations with the Global Network of Civil Society Organizations for Disaster Reduction (GNDR) ensured engagement of CSOs in the SOFF preparation process, with CSO involvement also expected at the national level for specific SOFF projects.

D. How to plan for scaling?

Principle 4: From the outset, identify systemic opportunities, constraints and risks; plan to align with them or address them through system change along the scaling pathway.

As noted earlier, GBON and SOFF are initiatives designed to improve the functioning of the highly complex global weather and climate analysis and prediction system. It therefore is explicitly linked to this system as an integral element. The SOFF programmatic and operational design reflects careful analysis of decades of experience with trying to develop sustainable meteorological capacity in developing countries, and especially in LDCs and SIDS, which often was not met with success due to a neglect of organizational and political constraints, poorly aligned incentives and a big disparity between the observing requirements and countries' capacity to pay for them. The Readiness Phase of SOFF operational support to a country will involve the assessment of the hydromet gap and development of a plan to meet GBON compliance; this will include an assessment of national constraints and opportunities for effective SOFF implementation using the Country Hydromet Diagnostics (CHD) tool.

In addition, the preparation of SOFF took great care to analyze the existing architecture of international development and climate finance to establish how SOFF could best be structured to reflect opportunities and constraints to the establishment of a new mechanism, without adding to the pervasive problem of organizational and financial fragmentation, and to respect the preferences of potential donors and recipients.

The SOFF funding model design focuses on appropriate funding modalities for different phases of SOFF implementation:

For the Readiness Phase, funding of free peer-to-peer assistance with a cost-recovery provision for the assistance provider;

For the Investment Phase, grant funding for SOFF projects embedded in wider hydromet projects of implementing entities;

For the Compliance Phase: results-based grant finance for 75 percent of O&M costs provided observation stations share GBON compliant data, to ensure sustainability of the observation assets.

The SOFF design recognizes that in the absence of a general global public goods financing mechanism (e.g., some kind of GPG tax) sustainability of SOFF as a financing mechanism to provide indefinite support for LDCS and SIDS will require an appropriate capitalization to start with and subsequently regular replenishments of financial resources from donor countries. An active resource mobilization effort was undertaken over the last nine months; it will continue to ensure adequate donor finance for SOFF to reach its scale goal.

During the SOFF preparation process key risks were assessed and mitigation options identified.

Principle 5: Develop in a participatory way a scaling strategy and implementation pathway(s) to achieve the sustainable scaling vision.

The preparation process of SOFF prominently included the development of a scaling strategy and pathway and summarized in the Terms of Reference document prepared for its inception. (WMO, UNDP, UNEP 2021). The strategy comprehensively presented the scaling pathway as described in this paper.

E. How to implement scaling?

Principle 6: In line with the scaling strategy, mobilize resources and institutional capacity and create demand for the scaling initiative by aligning incentives and pursuing advocacy to enlist stakeholders and change attitudes, mindsets and social norms.

At this stage in the development of SOFF implementation can only be assessed prospectively. The basic approach of SOFF is to demonstrate the approach during the first three years of implementation for subsequent applications, suitably adapted after taking into account lessons learned (including from an external evaluation). The analytical tool to assess the hydromet needs of developing countries was pre-tested during the preparation of SOFF. Countries and donors will be able to access and see in real time the improvements in data sharing achieved in SOFF supported countries. The open access and transparent data exchange monitoring tool (WDQMS) and regular reports produced by WMO will allow to easily and jointly monitor progress and success.

The financing model of SOFF is specifically designed to ensure alignment of incentives with the need to achieve sustainability of delivery of observations from LDCs and SIDS. The results-based financing approach for funding O&M expenses provides clear support for delivery of data, rather than for just creating observation infrastructure. Peer-advisory organizations will have an incentive to provide peer-to-peer advice since their costs will be reimbursed. Similarly, implementing agencies will have access to high quality technical assistance that will ensure the effectiveness of their investments and provide foundational data for the implementation of the other components of the hydromet and climate projects.

As regards population groups potentially adversely affected by SOFF investments, this should be a limited problem, since the observation infrastructure is likely to displace very few people, if any. There could be negative effects on employment of meteorological staff to the extent progress in automation which could be supported by SOFF, would results in reduce employment. SOFF will largely rely on the social, environmental and gender safeguards of the implementing agencies, while working with the Steering Committee and Advisory Board in ensuring that SOFF responds to the needs and views of stakeholders and vulnerable communities.

During the preparation of SOFF special efforts were made to mobilize champions (see the many video recordings of a statements of support by high level national and international personalities: https://public.wmo.int/en/our-mandate/how-we-do-it/development-partnerships/Innovating-finance/SOFF-support-statements). Communications to potential donors (including four virtual meetings with donor representatives) were intensively pursued during preparation and are planned to continue on an ongoing basis. Similarly proactive outreach through the WMO membership (mostly representatives of national meteorological offices) will need to continue to ensure national-level ownership and demand for SOFF engagement at country level. Community participation and civil society engagement will be an important element to ensure that local communities understand the importance of observation stations and help precent vandalism or pilferage.

Principle 7: Iterate, learn, adapt and sustain the scaling pathway as long as needed.

This principle is reflected in the basic design of SOFF in two ways:

A three-year First Implementation Period will be followed by the 7-year Expansion and Sustaining Period, with an explicit provision for monitoring, evaluation and learning along the way. An external evaluation is planned for halfway during the First Implementation Period based on which the initiative will be adapted as necessary.

The three-phase operational approach of SOFF at the country level allows for initial evidence gathering (Readiness Phase), investment (Investment Phase) and sustained support (Compliance Phase).

Sustainability is a prime concern of SOFF in light of the experience with past failures of maintaining observations capacity once created. Financial sustainability of observation assets in LDCs and SIDS will be supported by O&M grants for observation stations sharing GBON compliant data. Institutional sustainability will be supported by peer-to-peer advisory services. Political sustainability will be supported by the fact that grant funding will be made available to finance investment and O&M expenses and by proactive outreach to recipient countries by SOFF, by WMO, and by the implementing entities. Financial sustainability of SOFF itself is not guaranteed; it will depend either on the introduction of a general GPG financing mechanism or on regular donor replenishments.

SOFF is specifically designed to take a long-term approach, initially for at least 10 years, and potentially indefinitely, as long as the problem of sustainability of observation assets in LDCs and SIDS remains (as a result of the GPG nature of observations and the low level of resources and capacity in these countries).

F. Based on what evidence?

Principle 8: Base all scaling decisions on relevant evidence and continuous learning.

The preparation of SOFF was based on a thorough assessment of the experience with support of observations in developing countries and the problems with past approaches. It also involved a careful analysis of benefits to be expected from a successful implementation at scale of SOFF. The results framework is a simple input-output framework at this point, but with metrics for input and output targets. As SOFF matures and gathers implementation experience additional performance evidence and metrics will likely be added to reflect the degree to which SOFF is responding effectively to changes in observation technology, to the constraints in recipient countries, and to possible limitations in the capacity of its implementing agencies.

4. Conclusion

The SOFF scaling journey is only at its beginning, but judging by how it measures up against the scaling principles from the above account, it is doing well in that it has addressed and promises to address many of the challenges that scaling a new initiative into an existing complex global system presents. At the same time, it appears that the eight scaling principles represent a useful checklist in assessing whether and how SOFF has taken an effective scaling approach during its preparatory phase and should also be helpful in guiding future action.

However, from the first-hand engagement of the author, the SOFF experience also faced – and will continue to face – a number of challenges and risk which are not atypical for an initiative of its kind and will need to be kept in mind going forward.

- **Complexity of the hydromet and climate finance system:** SOFF is placed at an important node of a highly complex system, where it has a critical intermediary role to play in ensuring the many actors

that have to work together actually do so. But with that role comes a huge challenge. The SOFF Secretariat must (a) work within the WMO and its membership in support of implementing and monitoring the GBON agreement; (b) incentivize and organize the more advanced meteorological organizations to provide technical peer support to the meteorological service agencies of the LDCs and SIDS; (c) identify and support the countries willing and interested in carrying out a SOFF gap analysis and prepare a plan for action; (d) ensure flawless cooperation among WMO, UNDP and UNEP and orchestrate the activities of the implementing agencies that draw on the SOFF funds for improving observational capacity as part of their hydromet projects; (e) engage with a multitude of other actors in the climate and development finance space to ensure complementarity and effective coordination of support for recipient countries across the hydromet development value chain; (f) mobilize financial resources from some 30 funders; and (g) interact with private sector entities and CSO representatives to ensure appropriate feedback while also managing a general communication and outreach process to educate the wider public on the importance of weather and climate observations.

- **Convincing potential funders that improvements in weather and climate observations are of critical importance:** The process of resource mobilization during the preparation phase was more difficult than expected for various reasons, including these: (a) new multilateral initiatives are always more difficult to fund than continuation of funding for ongoing programs; (b) the COVID pandemic made in-person interaction with the funder capitals impossible; (c) many potential funders are less interested in funding upstream improvements in the hydromet value chain (observations) than down-stream action to improve early warning and resilient adaptation for the "last mile"; this tendency which is reinforced by the fact that there is a great gap between the meteorological community and the entities operating in the international climate and development space; and (d) meteorological centers rank low on the totem pole of agency influence compared to the traditional develop and climate finance agencies. This challenge puts a premium on SOFF demonstrating its value-for-money in the overall hydromet space and in its contribution to climate and resilient development action. SOFF's intention to careful monitor its impact and develop improved metrics for socio-economic impact measurement are an appropriate response to this challenge along with continued intensive efforts to reach out to donors.
- **Competing priorities in the founding agencies:** SOFF has to contend with competing priorities not only among funders, but also within the founding agencies – WMO, UNDP and UNEP. The leaderships of these agencies have to foster other initiatives besides SOFF and may not always put SOFF on the top of their institutional list of priorities when seeking funding and reaching out to global stakeholders. Again, this means that the value added of SOFF-supported activities must be clearly demonstrated.
- **Other risks:** There are a number of other challenges and risks which the SOFF team identified as part of the SOFF Terms of Reference (WMO, UNDP, UNEP 2021):
    - There is a lack of demand for and ownership by the countries due on the one hand or, on the other hand, excess demand relative to SOFF capacity;
    - There is a lack of interest and engagement by implementing and peer advisory agencies due in part to insufficient incentives;
    - Incentives offered by SOFF for O&M in the form of results-based grants are insufficient to get meteorological offices and governments in recipient countries to maintain stations and share observational data;
    - Overwhelming difficulties of implementation are incurred in fragile and conflict affected stated.

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