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Scaling Up SCI: Social Capital-Centered Integrated Strategy for Enhancing Production with Equity and Climate Resilience

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Abstract

The major barriers associated with the scaling up of SCI, especially in the small farm sector, are interwoven. These include lack of proper coordination of activities of many farmers operating on small holdings, inadequate economic capacity & poor input-output services. Therefore, up-scaling efforts should not focus only on a single barrier or just on knowledge building and dissemination. Moreover, environmental degradation such as erosion and pollution are caused by the cumulative effects of non-point sources or the individual decisions by many small farmers. These cannot be effectively dealt with through point source control mechanisms. For example, unless these users are informed, motivated, and organized to collectively adopt conservation-based production, environmentally inappropriate decisions will continue to be made. Therefore, investing in Social Capital is beneficial for managing Natural Capital. FO-managed Collective Action, CA would capture economies of scale, initiate a commercialization process, and develop mutually beneficial partnerships with the private sector promoting small farmers to actively engage in market economy while maintaining equity. Hence, the paper explores the scope for enhancing resource use efficiency and overall production to ensure equitable food security and climate resilience through the combined effects of SCI and CA by farmers. Organized CA and an integrated approach can play a key role in widening SCI adoption through coordination and minimizing conflicts. In this context, the paper proposed an integrated strategy centered around social capital for enhancing production with equity and climate resilience.

Key words: Upscaling, collective action, Resilience, Conservation, Social Capital

Introduction

"The merit of an agroecological approach for achieving more productive phenotypes from given genotypes of rice has been validated through a number of well-designed agronomic studies (e.g., Lin, Zhu, Chen, Cheng, & Uphoff, 2009; Thakur, Rath, Patil, & Kumar, 2011; Thakur, Rath, Roychowdhury, & Uphoff, 2010; Thakur, Uphoff, & Antony, 2010; Zhao et al., 2009) as well as for wheat (Dhar, Barah, Vyas, & Uphoff, 2016)" (Adhikari, Prabhakar, *et al.,* 2018).

The present paper addresses the question "how social capital could be invested in scaling up of SCI to enhance production and climate resilience in the small farm sector". The proposed holistic strategy blends a few crucial components classified under two broad categories. The presentation is organized under these aspects. A brief conclusion is submitted at the end.

1) Why social capital? - Small farmer collective action and social equity
2) "Production with conservation": Enhancing productivity and climate-resilience
3) Conclusion

Why social capital? - Small farmer collective action and social equity

"Following the lead of economics, we regard any capital as referring to certain assets that produce definite flows of income, also referred to as streams of benefit. The benefit that we and most generally associated with social capital is mutually beneficial collective action (MBCA)…. (Social capital) benefits individuals and is expected to produce goods that are more collective than just individual (Uphoff and Wijayaratna, 2000, p.1876).

An integrated approach focusing on small famer profits to accelerate the scaling up of SCI: Crop yield and profit of (small) farmers practicing SCI depend on a variety of complementary factors including the adoption of other technologies, input-output markets (and prices)

etc. Collective Action, CA by multi-functional Farmers' Organizations (FOs) including Farmers' Companies and Farmers' Cooperatives can scale-up conservation-based production focusing on ecologically-sound, high-productive water and land saving practices specially SRI, SCI, if they are combined with other complementary agronomic practices/technologies, input-output services including extension and credit. Moreover, the government line agencies can expand their services, such as agriculture extension and input services more effectively if they work through FO networks. ADB-supported Chhattisgarh Irrigation Development Project, CIDP, adopted such an integrated strategy based on CA and, within 3 seasons, SRI adopters increased from 52 to 5378 (Area under SRI increased from 29 to 4286ha). *"Catalyzing and facilitating a strong, vertically and horizontally integrated network of FOs (can) manage collective action for enhancing agronomic efficiency, farmer incomes, and agroecological sustainability"* (Wijayaratna and Uphoff, 2017).

Economic strength for small farmer to "mechanize" and move beyond on-farm activity: CA managed by a strong network of FOs would enable small farmers to move beyond on-farm activity, for example, to enhance their profits through post-harvest management, including processing and value-addition. When SCI is adopted for perishable crops postharvest losses can minimized through CA. FO-managed CA will capture economies of scale and initiate the commercialization process. This will widen the use of mechanization, such as motorized weeders, thereby accelerating SCI scaling up while enhancing social equity. Commercialization of small farm agriculture is important not just as a survival strategy but for them to become active partners of a market economy. The strategy would develop mutually beneficial partnerships with the private sector to facilitate small farmers' engaging more fully/fairly in market economy

More inclusive growth: In addition, an inclusive FO Network paves the way towards a powerful mechanism for gender and weaker sections of society. For example, for the first time in India, under the ADB-supported Chhattisgarh Irrigation Development Project (CIDP), seats were reserved for women and disadvantaged groups (Scheduled casts and tribes and other backward classes, SC, ST and OBC). These targets have been achieved in the 2007 Water Users' Election, country-wide (1324 WUAs) (ADB 2012).

Diversified farming systems organized through CA: This would enhance nutritional security (and enhance diversity of nutrition), increase income for more people due to CA and ensure equitable distribution of benefits. Diversification has additional benefits including sustainability of conservation-based production, contributing to cost-effective pest & disease management (P&D), year-round cropping and associated continuity in productivity / supply (and therefore income stream), reduction in expenditure on food while improving the quality (partly due to micronutrients which would otherwise be "missed") and access to different food items (and, perhaps diversity in "taste" as well), nutrient recycling, enhancing water productivity (for example, due to different root zones of different crops). Reducing malnutrition too is an added advantage of diversification.

Collective Action, CA would address the crucial questions: "*Once farmers are successful on the agronomic side, how can they be as successful on the economic side? Or how can they avoid agronomic success leading to economic setbacks? Good answers to these questions are crucial for food security and eradicating poverty* (Wijayaratna, Mishra and Uphoff, 2018).

"Production with conservation": Enhancing productivity and climate-resilience

In the small farm sector, where the farming decisions within a given agroecological zone are taken by many individuals with varied interests, knowledge, skills and attitudes, it would be difficult to achieve substantial environmental benefits without coordination and cooperation and unless the interventions are widely adopted. For example, pollution by the excessive use of hazardous agrochemicals or erosion due inappropriate land use are caused by non-point sources (or the actions by many small farmers) cannot be effectively dealt with using the point source control mechanisms. Without organized CA, for adopting conservation-based production collectively, environmentally inappropriate decisions will continue to be made. Therefore, investing in Social Capital in Protecting Natural Capital or a participatory approach involving organized CA is proposed. Such an approach of agroecological crop management, primarily based on SCI (and SRI where applicable) can contribute to sustainable "production with conservation".

FAO recommended stepwise process (originally suggested by Gliessman, 2006) can be adopted widely through FO-organized CA. For example, the use of environmentally damaging high-cost chemical inputs can be minimized as

the first step. FOs can "own" soil-testing kits" and the use of chemical fertilizer can be reduced. Next, substitutes can be promoted collectively. CA is necessary for redesigning ecosystems in the small farm sector. A strong FO Network can establish direct links with the consumer. Mutually beneficial partnerships with the private sector too can be established.

Ecological agriculture is a promising approach for sustainable terrestrial carbon sequestration. Combined with its positive effects for sustainable development, *"organic agriculture is a strategy particularly suitable for degraded areas and communities with limited access to external agricultural input. Creating access to carbon markets for these communities could be a way to combine climate change mitigation with food security and rural development in a synergistic and efficient manner"* (FAO, 2009, p22).

Watershed-based multi-level organizational structure

A watershed is a hydrological unit composed of sub-watersheds. Micro and mini watersheds are nested within sub-watersheds. How the land and water in the upper parts of the watershed are used affects its use downstream. Therefore, an integrated participatory management approach can consider linkages between these "nested" subsystems aiming at optimizing watershed-wide (land and water) use efficiencies. It can adopt plan and implement a process involving the hierarchically nested hydrological units and, a "matching network" of users' organizations. The planning and implementation method and strategy needs to cover the complete network of hydrological units including sub-watersheds and even up to its highest order, namely**,** the river basin. It is beneficial to link the users' organizations of the upstream watershed and downstream or irrigation command areas. This provides a robust framework for natural resources management. It is also essential to establish an institutional framework that satisfies the interests of resource users in all segments of the watershed while conserving the natural resources.

A multi-level organizational structure of FOs is envisioned. At the base level, community involvement can be based on mini or micro watersheds-level FOs. These can act as building blocks of institutional framework. These can be federated upwards to sub-watershed-based FOs and ultimately to form a strong Watershed (or River Basin) FO Network. FOs can be strengthened through participatory methods, specifically experiential capacity building. These organizations can manage land & water and undertake the construction of minor water and soil conservation and water harvesting, organize the adoption of an improved and environmentally friendly package of practices (POP) for production (e.g., crop and livestock).

There is a need for changing attitude and behavior and most importantly organizing the activities of watershed resource users. Hence, a catalytic or mobilization effort would be required at the initial stages to a) create resource users' awareness, b) enhance knowledge and skills on production, conservation and related services, and c) to organize CA for adopting conservation-based production.

FOs can strengthen themselves through the process of experiential capacity-building; what is required would be a process of planned intervention/social mobilization. Introducing and internalizing self-monitoring and evaluation as well as participatory action research would be integral components in the FO development process. In the scaling up process of SCI, farmers will share experience and learn from each other. Therefore, members with differences in skills (and knowledge) would mutually benefit. All the members will benefit from FO-managed input-output services and other business including value added industry. FOs will have legal recognition, bargaining power, the ability to reduce transaction costs and better access to credit (for example from Banks and by pooling members' contributions).

Conclusion

The major barriers associated with the scaling up of SCI and achieving climate resilience such as inadequate knowledge and skills, lack of proper coordination of activities of farmers operating on small holdings, inadequate economic capacity & poor input-output services are inter-linked. Therefore, up-scaling efforts should not focus only on a single barrier or just on knowledge building and dissemination. Addressing this issue is extremely important because the success of agroecological approaches like SRI & SCI depends much on "achieving more productive phenotypes from given genotypes". On the other hand, small farmers can be mobilized and assisted towards an integrated strategy centered around Social Capital or Collective Action (CA) for enhancing production with equity and climate resilience. Farmers' CA can deal with most of the factors influencing the scaling-up of SCI (and SRI). Then the overall productivity and profit will be greater, and farmers can capture the full benefits of SCI. Moreover, Farmers' Organizations would capture economies of

scale, initiate a commercialization process and develop mutually beneficial partnerships with the private sector promoting small farmers to actively engage in the market economy while maintaining equity. This should help to accelerate its rate of adoption. The strategy is illustrated in Figure 1.

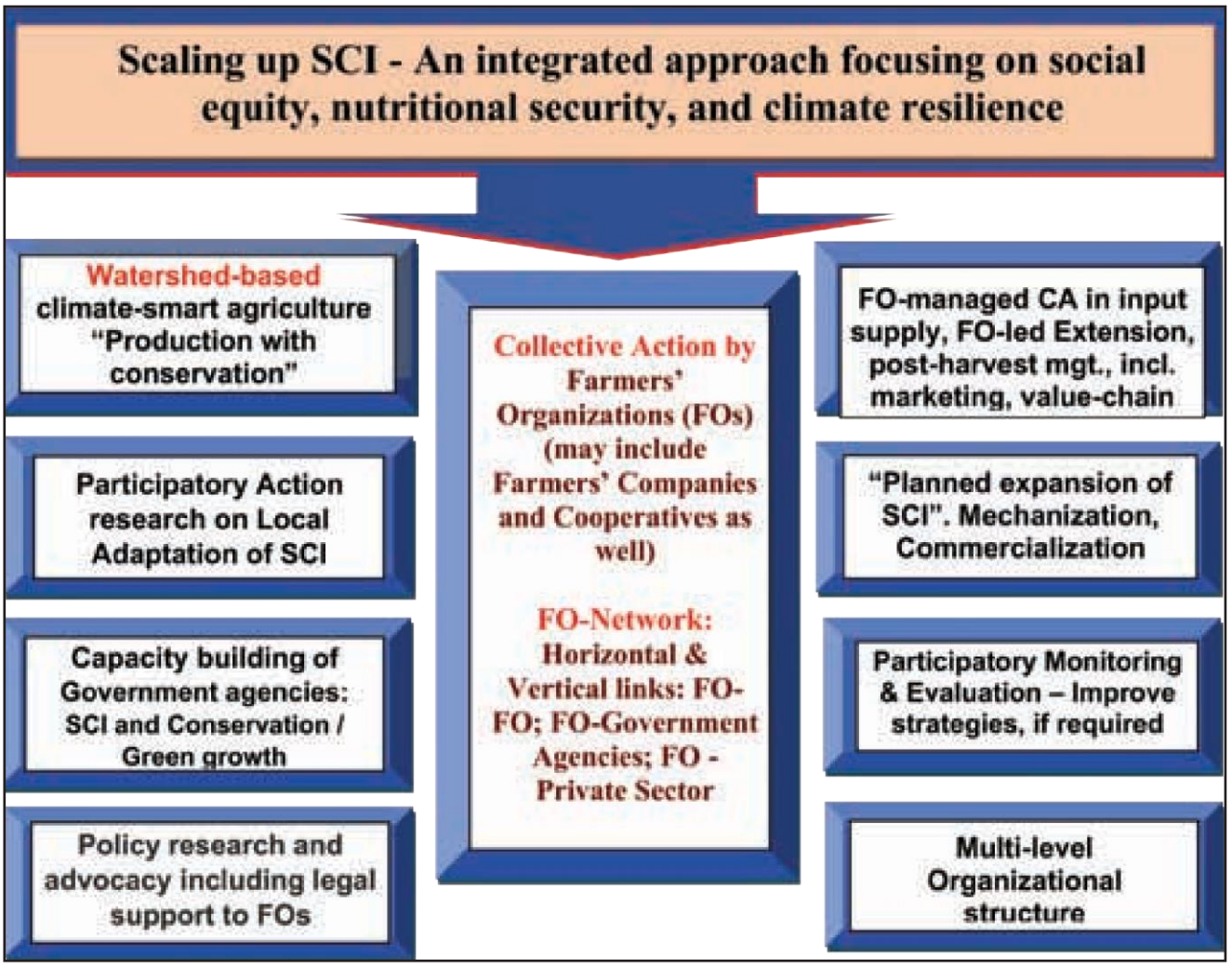

Figure 1: Scaling up SCI: Social capital-centered integrated strategy for enhancing production with equity and climate resilience

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