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Policy Research

Effectiveness of private sector and NGOs in improved agricultural outcomes: A rapid assessment of global evidence.

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ABSTRACT

A rapid assessment of evidence (RAE) or rapid review is a type of policy research in the tradition of evidence-based approach in which a policy decision is made on the basis of robust research evidence. The procedure helps to collate the evidence of effectiveness of interventions under review. The method, however, doesn't cover the entire effect available in the repository of knowledge and considers only sources that provide only high effect that is easily accessible. That is chiefly the reason the process is termed as rapid assessment of evidence which is helpful in gaining a quick policy opinion.

The current paper follows rapid evidence assessment and synthesizes the evidence of successful agricultural interventions that have been run by NGOs or private sector organizations. This is a two tiered activity in which evidence from India and evidence from World was accessed and processed separately. The study identifies most effective and efficacious interventions through critical appraisal. The study also analyses as to which identified interventions are feasible to be replicated in the context of India and particularly the state of Uttar Pradesh. In this way, the outcomes of this study could help the policy stakeholders of agricultural development in Uttar Pradesh to identify most suitable interventions with high likelihood of success.

Keywords: rapid review, evidence assessment, agricultural interventions, agricultural outcomes, NGOs, private sector

In order to ascertain the emerging role of NGOs and private sector in strengthening of agriculture in Uttar Pradesh for livelihood security, an evidence-based approach has been followed in which global evidence taken from the developing economies has been synthesized for its efficacy and effectiveness and used to develop general policy recommendations. Such recommendations are important to influence agriculture policy of Uttar Pradesh where the role of NGOs and private sector has to be determined in livelihood

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security. Therefore, research studies assessed for their rigour and credibility were identified with the help of general search, picked from meta-evaluations, systematic reviews and evidence-based impact evaluations. Major component have been referred from a meta-evaluation of IFC- The World Bank Group (Nankhuni & Paniagua, 2013).

Current document provides evidence on effects of private sector and NGOs interventions in overall agricultural development that directly influence livelihood security on certain performance indicators such as: agricultural productivity (yields per acre/hectare); revenues/income/profit of small and medium enterprises (SMEs) and/or farmers; and resulting impacts on well-being of farmers.

Although not necessarily exclusive but the following categories of livelihood related interventions have been identified for the guidance of evidence search for this document:

1) Farmer training/SME training (Business edge);

2) Enabling farmers' access to inputs and capital goods (seeds, fertilizers, agro-chemicals, farm equipment, micro irrigation);

3) Access to Finance (Agrifinance, risk sharing/risk management/insurance markets, warehouse receipt financing, trade financing, etc.);

4) Infrastructure (Concessions/PPP for storage, irrigation, transport, Agriports, etc);

5) Traditional Agriculture (crops, poultry, other livestock, aquaculture/fisheries, forestry);

6) Value-chain activities (farmer organization, linking farmers to profitable markets, EST/certification/fair trade, market development, etc);

7) Investment climate (regulatory reform for input markets, (e.g. seeds), warehouses, contract farming frameworks and logistics, sector-level competition policy (e.g. with parastatals, commodity pricing), agribusiness investment promotion, trade logistics reform and sector level reform on incentives and tax);

8) Strategic community investments and corporate governance;

9) Natural Resource Management (land and water efficiency, E&S standards, adaptation such as risk sharing/risk management/insurance markets, etc.).

Research question:

Present research aims to identify successful agricultural programs deployed by NGOs and private sector organizations in India as well as abroad. The research further synthesizes the effectiveness of these identified programs in objectively ensuring their effect onthe targeted outcomes such as livelihood security and elevation of the quality of life of the beneficiaries. Therefore, the following research question has been formulated to guide this review:

"Which agricultural programs run by NGOs and private sector organizations successfully achieve the outcomes like better livelihood security and improved quality of life for the beneficiaries?"

METHODS

A conventional methodology for this evidence-based research was followed whereby a PICO format was determined to steer the study. The *population* was any chosen populations including rural communities associated to farming or allied occupations at village, district and national level in India or other developing countries. Social sub-groups, ethnic communities or tribes were also considered. *Interventions* included any programs supporting agriculture or allied activities for farmers or non-farming agricultural beneficiaries and run

by any well-defined NGOs or private sector organizations. *Comparison* included 'Before' and 'After', 'With' and 'Without', 'More' and 'Less' intervention. *Outcomes* focused at observable, tangible and effective improvements in sustainable economic gains and resultant betterment to the quality of life of the participants.

Search:

The search strategy was designed separately for India based interventions as well as for international interventions. Both searches comprised of four categories of electronic resources for systematic search with terms for title and abstract screening. First category involved major databases such as ISI Web of Knowledge, SCOPUS Science Direct, EBSCO, CINAHL, and Web of Science, second category involved search websites such as google and google scholar, third category involved organizational resources such as CSA Natural Sciences Document Repository, Asian Development Bank (ADB) African Development bank (AfDB), Overseas Development Institute and CEE, fourth category involved directory of open access journals and subscribed journals. Non-electronic and Grey literature was not included.

Inclusion/exclusion criteria:

Intervention studies which followed the designs of total randomization, quasi-randomization, cluster randomization, observational or single studies focusing the outcomes directly or indirectly were used. Considered methods also included econometric analyses, post-investment appraisal reports, technical assessments (e.g. economic/engineering/financial institutions), case studies, sector analysis reports which may or may not depend on cost-benefit analysis, Simultaneous Equation Model, Quantile Regression, Ordinary Least Squares, Generalized Method of Moments, and Principal Components. Researches which studied the targeted outcomes in combination of other outcomes were also included.

Data extraction and synthesis:

Data was extracted and organised with the help of a reference manager and tabulated accordingly. For the included studies, CASP tool was intended to be used for the critical appraisal of the randomized and quasi-randomized studies. Narrative synthesis was used where the use of CASP was not possible. Calculation of pooled effects and forest plotting were not found feasible.

RESULTS

Results out of the synthesized information have been categorized accordingly. For ease of use of results for policy makers, technical details such as search designs, search chart and statistical figures were omitted from reporting. The results have been presented in the form of narratives below:

EVIDENCE FROM INDIA

Before extracting the policy recommendations on the basis of the global evidence, it would be appropriate to cite the briefings from the successful interventions representing India. These agricultural interventions were fully or partially delivered by the NGOs/private sector organizations and their effects were adjudged to be replicable; therefore they qualify in the first place to inspire the agricultural policy of Uttar Pradesh. The extracts of the studies represent certain sub-areas of agricultural development e.g. access to finance, farmer training, innovation grants to farmers, farmer field schooling and food security.

A: Access to finance (A2F) intervention

1. **Access to credit: Indian Social banking Experiment** (Burgess& Pande, 2005)

Bank branch expansion in previously rural unbanked areas of India between 1961 and 2000. The expansion mainly resulted from a , 1977 new 1:4 branch licensing policy that mandated any bank wanting to open a new branch in an already banked area to do so only if

they had opened branches in four areas which previously have no bank branches. Using the discontinuities caused by the licensing policy the paper estimated the impact of the rural bank branch expansion on poverty. **The intervention was related to private as well as public sector**. University Professors conducted the evaluation. **Rural headcount poverty was reduced by 14-17 percentage points due to** branch expansions into rural unbanked locations.The paper highlighted the **reductions in rural poverty were linked to increased savings mobilization and credit provision in rural areas**, thereby enabling rural households to accumulate more capital and to get loans for longer term fruitfulinvestments.

B: Farmer and Business Training Interventions

1. **Private Investment in Capacity Building and its Effect on Sugarcane Productivity** (Diamond et al, 2013)

The project interventions with 2000 farmers were mostly in the area of intensive training and extension services during 2009 to 2012. The project team attempted to address critical constraints related to **irrigation and agriculture credit through linkages with the government schemes** and through small provisions from the project. **This is mainly a private intervention**. However some element of the interventions involved the public sector. The evaluation found **positive impact on sugarcane productivity**. **Productivity improved by 80%** among participant farmers compared to control farmers. However, the evaluation was not able to attribute the increased productivity to any of the interventions provided by the project, probably due to low number of observations that were used in the analysis.

2. **The eChoupal village internet kiosk project**

ITC Limited, A private company in India, provided Indian villagers access to information on farming of soybean, understanding of weather, and budgeting involving investments, services and yields (Goyal 2010). The project also provides "hubs" where farmers bring their produce for quality checks before a price offer is given to them. The simple procurement system by ITC Limited **resulted in savings of Rs 12.9 million in the first year of operation through better quality oil from the soy bought through eChoupal**.Farmers benefited through higher prices offered for their produce (13 percent increase in monthly prices), reduction in transaction costs (looking for middlemen to buy their produce), increased area under cultivation of soy, and increased profits. Other researchers also found comparable results such as Jensen (2007) **got for the populations of fishermen in India** and Aker (2008) for grain farmers in Niger. In both the cases beneficiaries **accessed information on fish and grain prices through their cellphones**.Since the systems generate profits for the companies and the farmers, these success stories are most likely going to be sustainable.

3. **The Rise and Fall of Training and Visit Extension: An Asian Mini-drama with an African Epilogue** (Anderson et al. 2006)

The **Training and Visit Extension system** was introduced following success of **the Chambal Irrigation Command project** (Rajasthan and Madhya Pradesh states in India) whose success were attributed to the T&V extension reforms. Other possible explanations of the success of the initial projects include: better management of the irrigation services; more timely availability of inputs; close attention of World Bank staff; small scale of the projects. Further needs of the project were: adjusting the design and implementation of the system to different situation needs; evaluating the projects rigorously using independent staff that had no conflict of interest before scaling them up; and assessing the likely sustainability of such costly schemes in the absence of donor funds.

C: Innovation grants to smallholder agricultural producers

1. **Supporting local innovation for rural development: analysis and review of five innovation support funds.**(Friis-Hansen & Egelyng, 2006)

This desk study reviews 5 innovation support funds or funding concepts: **the Indian 'National Innovation Fund' (NIF)and its associated web of institutions**; the GTZfunded 'Small-Scale Project Fund' (SSPF); the NGO concept 'Promoting Local Innovation in ecologically oriented agriculture and NRM' (PROLINNOVA); the FAO's project, 'Promoting Farmer Innovation – Farmer Field Schools' (PFI-FFS); and the CIALs in Latin America. The review develops an analytical framework to analyse the innovation support funds and concludes with a recommendation for establishing a global innovation facility that could enhance the **effectiveness of existing innovation support funds and the global expansion of activities by facilitating institutional learning, exchange of experiences between the funds and provision of technical assistance.**

2. **Farmer Access to Innovation Resources (FAIR): findings from an international review of experiences.(**van Veldhuizen, et al, 2005)

This paper reviews and summarises experiences with various innovation funds: CATFs, CIALs, SSPF, ATIRI, SFFFS (self-financed FFS), NIF, C3F (City-Community Challenge Fund), Innovatie Fonds Tuinbouw and LIBIRD () and translates insights on the following aspects to the operational design of LISFs. It treats a range of elements of grant system administration, **such as farmer-owned funds versus institutionally based funds, level of decentralisation, time horizon, and fund replenishment/fund raising.**

D: Farmer field schooling interventions

1. **Evaluating cotton integrated pest management (IPM) farmer field school outcomes using the sustainable livelihoods approach in India.**(Mancini et al, 2007)

In an effort toreduce pesticide input and enhance sustainability of cotton production systems, **Farmer Field Schools (FFSs)** were conducted in Southern India. This study was carried out to determine the additional benefits of FFSs in the social and economic arena, using the Sustainable Livelihoods (SL) concept to frame the evaluation. Farmers who had participated in the IPM FFSs perceived a range of impacts much beyond the adoption of IPM practices**. The reduced cost of cultivation allowed for financial recovery from debt and the building of physical assets.** IPM FFS households and production systems were perceived by the participants to have become **more economically resilient** than non-IPM FFS control groups when faced with adversity. In the participants' view, IPM FFSs also led to **enhanced individual and community social well-being**, a benefit valued in particular by the women participants.

2. **Impact assessment of farmer field schools in cotton production in China, India and Pakistan.**(Pananurak, 2010)

This study analysed the economic impact of a Farmer Field Schools (FFS) training program in Integrated Pest Management (IPM) in cotton in Asia. The program was known as "FAO-EU IPM Program for Cotton in Asia (China, India and Pakistan)". Program objectives were: (i) to gauge the impact of FFS training at farm level on productivity of cotton, use of insecticide and the overall environment, (ii) to assess the efficiency of project investment at the level of each country as well as in total (iii) to evaluate the extent of welfare caused the project. In this study, panel data were collected before and after the training from a total 808 of farmers in the three countries. The study compared three farmer groups namely 1. Participant/trainee farmers (FFS farmers), non-participant farmers of the same village (Non-FFS farmers), and non-participant farmers of different villages but of equal socioeconomic and agro ecological conditions (control group). Results showed that **in all three countries the**

FFS training is effective; **FFS farmers use less pesticide and choose those with lower toxicity**. The effects of FFS training however differ among countries. In terms of both cotton yield and gross margin, the Chinese participants performed better. On the other hand, in India, **there was no reported effect of economic impacts of FFS training on cotton productivity**. In Pakistan, however, all farmer groups showed lower yields because of uncommon pests in the year after training. **However, the FFS group still increased productivity and gross margin as compared to the other groups. The knowledge advancements positively affected cotton yield and gross margin in India** and China. Financial analysis revealed that **investments in farmers' training pay off in** Pakistan and **India.** In terms of **social cost benefit analysis, consumers in China, India, Pakistan and the rest of the world gain**, while producers in China and in rest of the world lose. **These results indicate that FFS training in IPM is useful, but program implementation procedures need to be undertaken with integrity.** Also, further studies are required to assess the full benefits from IPM technologies, by valuing the positive effects on environment and human health.

3. **Aspects of cotton and vegetable farmers' pest management decision-making in India and Kenya.**(Williamson et al, 2003)

This study focused on smallholder farmers who grew cotton in India and vegetables in Kenya. The researchers explored the perceptions, pest management practice, decision tools and sources of information of the participants**. Farmers trained under an Insecticide Resistance Management and two IPM Farmer Field School projects** were compared with untrained farmers from the same localities, using individual interviews and participatory group analysis methods. **Trained farmers' decision-making was enhanced**, by the use of more decision **tools and new sources of information and technologies** and they were generally **more confident in their pest management strategies** than untrained farmers. As a result, **trained farmers reduced their pest management costs** but did not always obtain higher gross margins. Issues of gender, sustainability, economics and group action are discussed, along with recommendations for research and extension to take a closer look at farmers' decision-making processes in cash and subsistence crops.

E: Food security interventions

1. **Adoption, impact and discontinuance of integrated pest management technologies for pigeon pea in South India.**(Ramarao et al, 2011)

The integrated pest management (IPM) program was adopted and its impact was observed on pigeon pea cultivation in Andhra Pradesh, India. Major amongst the components of IPM were **summer ploughing and spraying of Neem Seed Kernel Extract** (NSKE). A regression analysis revealed that **farm size, participation in community-based organizations, ability to recognize the insect pests, education and age predicted the decision to adopt IPM significantly**. There were variations in the extent of IPM adoption among farmers. The adoption of IPM led to **reduced use of insecticides and increased net returns**. Moreover, trend of **new-generation insecticides** led to a termination of IPM practices.

2. **Community-driven development and scaling-up of microfinance services: case studies from Nepal and India.**(Sharma, 2004)

In this case study, the scaling-up experiences of two microfinance institutions have been examined. The institutions are: the Nirdhan Utthan Bank Limited (NUBL) in Nepal and the **Self-Help Group (SHG)-Bank** linkage program of the **National Agricultural Bank for Agriculture and Rural Development** (NABARD) in India. The major two community-based drivers are (A)client preferences closely influence loan products which is evident by strong demand to join the program, high repayment rates, and very low dropout rates. (B) The integration of clients into groups has a significant empowering effect, it provides voice and attendant bargaining power to disadvantaged class. Standardization of rules of conduct and

basic service delivery mechanisms (and, in the case of NUBL, standardization of financial products themselves) was key to swift replication in both India and Nepal. In India, NABARD recognized the core advantages of group-based finance **but adopted the linkage model that linked groups of poor women to pre-existing commercial banks**. The NABARD experience is government-led. The explicit and implicit subsidy content of both NUBL and the NABARD program is fairly high, and constant enlargement of both programs is mainly dependent on whether the policy regime of directed credit continues. The high cost of setting up and running SHG-promoting institutions has stalled the expansion of services in the remote north-eastern states of India. E**ncouraging the development of self-financing and – regulating group federations** could be an option for both the countries. Such group federations which function well too are emerging in parts of India. These federations may well become the key to consolidating gains made so far in ensuring that the **programs are primarily driven by the interests of clients and making the transition to an eventual end of subsidies**. Finally, the facilitation of growth of institutions is very much dependent on the quality of the broader national environment. NUBLs growth leveled off just as **expansion of SHGs accelerated in India**. This was not a coincidence. The microfinance sector received **supporting environment in India which facilitated its own unparalleled expansion** whereas in Nepal the Maoist insurgency severely restricted its development.

3. **Adoption and Impact of Hybrid Wheat in India.** (Matuschke & Qaim, 2006)

Amidst the deliberations about the suitability of hybrid seeds for smallholder farmers, this study uses survey data to successfully claim that **farmers can benefit significantly from the proprietary technology** while analysing the adoption and impact of hybrid wheat in the country. There are certain factors involved in the process. While **access to information and credit influence the adoption decision,** farm size and subsistence level do not matter at all. Furthermore, the findings suggest that **adoption levels would be higher if seed prices were reduced**. In the wake of declining public support to agricultural research, researchers suggest that **policies should be targeted at reducing institutional constraints**. It would help to prevent the bypassing of resource-poor farmers by **private sector innovations.**

4. **Adoption and impact of hybrid wheat in India.** (Matuschke et al, 2007)

A follow up study that took place 2 years after the proprietary hybrid wheat, bred for semi-arid conditions was introduced. The wheat was planted on 1.5% of Maharashtra's wheat area and three districts were surveyed. The mean farm area was 1.5 ha. And survey took place in 2003-04. The comparison was made with conventional (OPV) wheat. Instrumental variables were used to compare yields of hybrid and OPV yields. **Estimated yield increased due to hybrid wheat was 20%**. Report recommends certain agro-ecological requirements such as access to irrigation and soil quality.

LOUD RECOMMENDATIONS

Recommendations on the basis of evidence while interventions were fully or partially delivered by the private sector organizations or NGOs in the context of developing countries:

- Access to finance (A2F) interventions generally produce positive impacts on agricultural outcomes such as adoption of technologies being promoted and resulting increases in production, productivity, and/or farm income and profits. There are, however, many impact assessments which have given mixed results for this intervention.
- Evaluations of farmer or business training provide positive impacts on adoption of technologies but mixed impacts on increases in farm income, profits, productivity and production. Most of the evaluations provide positive results only for some groups of beneficiaries. For example, only dairy producers benefited from increased production and sales in the Millennium Challenge Corporation (MCC) evaluation of the Production

and Business Services (PBS) activities in El Salvador, whereas value chains like coffee, fruit, horticulture, forestry and tourism did not benefit. A significant number of the evaluations, however, showed positive outcomes on production/productivity and farm income or profits.

- Only a few evaluations indicate positive impacts on livelihood of farmers and their households using the indicators of per capita consumption and poverty. On welfare indicators, however, only a few A2F evaluations indicate positive impact whereas farmer/business evaluations indicate zero or mixed impacts. Results from other systematic reviews found that generally there is no/limited evidence of positive impacts of microfinance interventions on well-being of poor people.
- Rural credit markets in developing countries are characterized by irregularities that are barriers to implementation of agricultural technology. For e.g. if there is a deficiency of access to formal credit, it may result in either inability of financial institutions to provide credit because the lenders are not able to enforce repayment from the borrower. There are uncertainties in agricultural production due to weather and crop price fluctuations and animal diseases. Such uncertainties discourage farmers from adopting unsafe but lucrative profitable farming technologies such as improved seeds or fertilizers. Existence of insurance markets can remove these imperfections. Consequently, better access to credit and insurance should cause augmented disbursement on farm inputs and capital equipment that should enable the beneficiaries to accept the relevant technology to increase production and yields.The likelihood is that there will be increased farm profits and incomes thereby augmented household income, which may help to reduce poverty.

PERFORMANCE EVALUATION: WHICH INTERVENTIONS WORK AND WHICH DID NOT:

On the basis of the meta-evaluation activity, policy researchers were able to identify the effectiveness and efficacy of different interventions or their components delivered fully or partially by the private organizations/NGOs in developing countries. The following points provide policy brief to the relevant authorities to design their own interventions or policies by performance evaluation of different interventions under different contexts:

- Old-styled top to bottom methods of providing extension/farmer training did not work. In particular, the Train and Visit (T&V) model that was supported by the World Bank over the past decades failed partly because it did not tailor the training to farmers' needs; it was a "one-size-fits-all" model. To avoid the pitfalls of the T&V approach, Andersen (2007) recommends to evaluate new extension approaches before making major investments in their scaling up.
- Most of the decentralized approaches face financial sustainability problems if some exceptions are left. For e.g., in a relatively successful Uganda National Advisory Services (NAADS) program only 2% of the cost of training farmers is contributed by the beneficiaries. Major part of funding (80%) is paid by donors, 14% by the central government and 4% by the local governments. The program covers about 20% of farming households in Uganda. This suggests that scaling up is most likely unsustainable especially when donors pull out.
- One of the sustainable ways of providing extension is delivery of these services by companies particularly in a model where the company and the farmer share benefits of the extension,. As already pointed out, all other models (including the Uganda NAADS), although successful, are heavily dependent on donor funding and are therefore not sustainable. One of the potential services that is expected to produce higher impact is Fee-for-service design in which where farmers determine the type of information that is of priority to them. This method is more effective than free public or public fee-for-

service systems (Anderson 2007). **A potentially successful training model is fee-based nLogue model delivered in Ulagapitchampatti in India.** In this program farmers interact with experts about crops affected by diseases on a web camera and receive advice on treatment (Bhatnagar, 2005 cited in Birner et al. 2006).

- Some flagship training interventions that are very intensive and designed to enable trained farmers to diffuse the training to their neighbors do not show any evidence of trickle down or diffusion effects, especially to be mentioned program is Farmer Field Schools (FFSs). (Rola et al. (2002); Feder et al. (2004) and Waddington et al. 2013.
- Successful projects are marked by many outcome indicators which mainly address farmer limitations along the whole value chain. These are not limited to but mainly to provide training on good farming practices and management skills, to train on postharvest techniques, training on marketing skills and proving inputs in the form of grants or on credit and helping association of farmers to support them access better prices with dealers and ensuring that their produce meet required standards. One of the examples of the reputation of addressing limitations along the whole value chain, including ensuring access to market and certification is success of Kawacom organic (certified) coffee contract farming (Bowlig et al. 2009). Likewise, Drumnet in indorsing horticultural exports in Kenya underlines the need for ensuring market access and certification is an example of unsuccessful intervention (Asharf et al. 2008).
- The pattern of success of A2F indicates that credit availability combined with training on credit handling for the beneficiaries is almost standard method of guaranteeing realisation of goals. Some popular combining factors with A2F are with training and technical advice, with other interventions such as organizing farmers to transport and market their crops to an exporter in a coordinated way. Some of the unsuccessful training projects, e.g. it was difficult for the farmers of Armenia to adopt the relevant technology because the evaluation of the MCC training activities in that country did not deliver appropriate access to credit for the trained farmers (Fortson 2012).
- Information and Communications Technology (ICT)-based models indicate potential as effective means of availing market information. **The eChoupal village internet kiosk project,** (discussed earlier) is an example of success. This program resulted in savings of Rs 12.9 million for the company in the first year of operation through better quality oil from the soy bought through eChoupal. The beneficiary farmers were offered higher prices for their produce, increased area under cultivation of soy, reduction in transaction costs and increased profits by cutting out the middle men. **Similar results were obtained for fishermen in India** and for grain producers and consumers in Niger. In India and Niger, beneficiaries accessed information on fish and grain prices through their cell phones respectively. These success stories are likely to stay on because the systems generate profits for the companies and the farmers.
- There is generally low demand for indexed micro-insurance products and pilot studies have not been scaled up to improve uptake, design of insurance products should involve training beneficiaries on components of the intervention itself (Hill and Viceisza 2010). Other essential components of insurance product designs are borrowers' trust towards the insurance provider (Hill and Viceisza 2010, Cai et al. 2010, Karlan et al. 2012, Karlan et al. 2011)and designing weather indexed insurance products pays out insurance benefits based on individual farmers' experiences as well, not just area crop yields or rainfall results (Giné and Young 2009).

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