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Rapid rural appraisal techniques for context-specific adaptation of extension delivery strategies

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Abstract

Rapid Rural Appraisal (RRA) is a family of participatory research methods designed to capture local knowledge quickly and at low cost, yet its application within formal extension programming remains inconsistent. This research evaluated how extension agents in Saudi Arabia used RRA techniques to adapt their delivery strategies to local conditions across four agricultural districts. A mixed-methods survey of 183 extension agents and 42 key informant interviews were conducted from November 2021 to May 2022. Five RRA techniques were assessed: transect walks, seasonal calendars, resource maps, focus groups, and key informant interviews. Results showed that key informant interviews (77.8%) and focus groups (67.9%) were the most commonly used techniques, while resource mapping was the least employed (46.6%). Agents who regularly used RRA scored significantly higher on a context-adaptation index (3.74 vs. 2.41, $p < 0.001$) than non-users. Government agents relied more on interview-based techniques, while NGO agents showed greater use of visual and participatory tools. The findings suggest that structured RRA integration into extension planning cycles can improve the local fit of advisory services.

Keywords: Rapid rural appraisal, extension delivery, participatory methods, context adaptation, agricultural extension, Saudi Arabia, transect walks, seasonal calendars, extension agents, advisory services

1. Introduction

Rapid rural appraisal can be defined as a set of informal, semi-structured methods that enable outsiders to learn about rural conditions rapidly and cost-effectively ^[1]. Developed in the late 1970s as an alternative to large-scale baseline surveys, RRA methods such as transect walks, seasonal calendars, and participatory mapping became standard tools in development planning ^[2]. And yet, despite decades of advocacy, their routine use within government extension services has been uneven across the Middle East and North Africa region ^[3].

In Saudi Arabia, agricultural extension services operate through the Ministry of Environment, Water, and Agriculture (MEWA) alongside several NGO-affiliated programs. The country's diverse agricultural zones-ranging from irrigated date palm oases to highland terraced farms-demand locally adapted extension content ^[4]. A top-down, standardized delivery model has been the norm, which sometimes results in advice that doesn't fit the farming realities on the ground ^[5]. RRA techniques offer a practical way for field agents to assess local needs before designing their programs.

Previous assessments in sub-Saharan Africa and South Asia found that extension agents trained in RRA were more responsive to farmer priorities and produced more relevant recommendations ^[6, 7]. In the Gulf region, however, no systematic evaluation of RRA use among extension agents has been published. This research aimed to assess which RRA techniques extension agents in Saudi Arabia used, how technique use related to the quality of context-specific

adaptation, and what barriers agents faced in applying participatory methods. The objectives were:

- To measure RRA technique usage rates among agents,
- To compare a context-adaptation index between users and non-users, and
- To identify differences between government and NGO extension channels ^[8].

Field research design

A comparative cross-sectional design was employed, surveying extension agents from both government (MEWA) and NGO programs across four districts: Riyadh, Qassim, Hail, and Al-Jouf. These districts were selected for their contrasting agricultural profiles and extension infrastructure density. Within each district, all active extension agents were invited to participate. The final sample comprised 183 agents (121 Government, 62 NGO). Key informant interviews targeted 42 senior extension supervisors and district-level coordinators ^[9].

Seasonal variations

Data collection ran from November 2021 to May 2022, covering the main winter cropping season (November-March) and the early date palm management period (April-May). Extension activity peaks during these months as agents conduct farm visits and planning sessions. RRA technique usage was expected to be highest during the pre-season planning window (November-December), which shaped the timing of the survey administration ^[10].

Material and methods

Material

A structured self-administered questionnaire was distributed to 183 extension agents across the four districts. The instrument measured frequency of use for five RRA techniques (5-point Likert scale), a 12-item context-adaptation index (Cronbach's $\alpha = 0.83$), perceived barriers to RRA use, and agent demographics. An interview guide with 14 open-ended questions was used for the 42 key informant sessions. Ethical approval was obtained from King Saud University Research Ethics Committee (Protocol KSU-AG/2021-071, dated October 4, 2021) [11].

Results

Table 1: RRA technique usage rates and context-adaptation index by agent type (n = 183)

Variable	All agents (n=183)	Govt (n=121)	NGO (n=62)	χ^2 / t	p-value
Transect walks (%)	58.0	64.3	51.7	2.74	0.098
Seasonal calendars (%)	58.1	47.8	68.3	6.81	0.009**
Resource maps (%)	46.6	38.2	54.9	4.62	0.032*
Focus groups (%)	67.9	72.1	63.8	1.27	0.260
Key informant interviews (%)	77.8	81.4	74.2	1.18	0.277
Context-adaptation index	3.21 $\pm$ 0.87	3.08 $\pm$ 0.91	3.47 $\pm$ 0.78	2.84t	0.005**

* $p < 0.05$; ** $p < 0.01$. NGO agents scored significantly higher on the context-adaptation index and used visual/participatory tools more than government agents

Table 2: Context-adaptation index comparison: regular RRA users vs. non-users

Group	n	Mean $\pm$ SD	t-value	p-value
Regular RRA users (≥ 3 techniques)	109	3.74 $\pm$ 0.68		
Non-users / occasional (<3 techniques)	74	2.41 $\pm$ 0.83	11.62	<0.001**

** $p < 0.01$. Regular users scored 1.33 points higher on the 5-point context-adaptation index, a large and significant difference

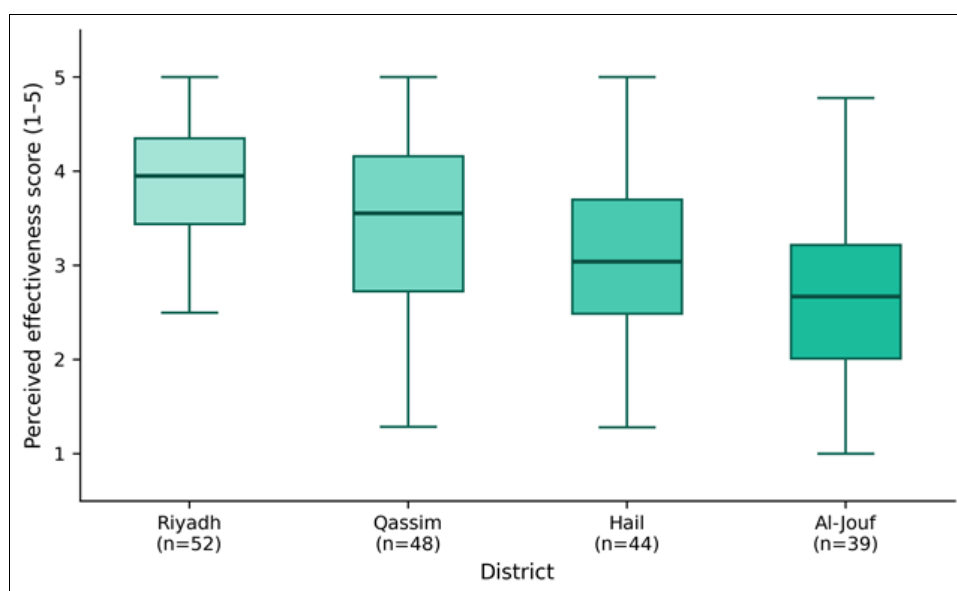


Fig 1: Distribution of perceived RRA effectiveness scores across four agricultural districts (1-5 scale)

Riyadh district agents reported the highest median effectiveness scores, while Al-Jouf agents scored lowest,

reflecting differences in training exposure and institutional support for participatory approaches.

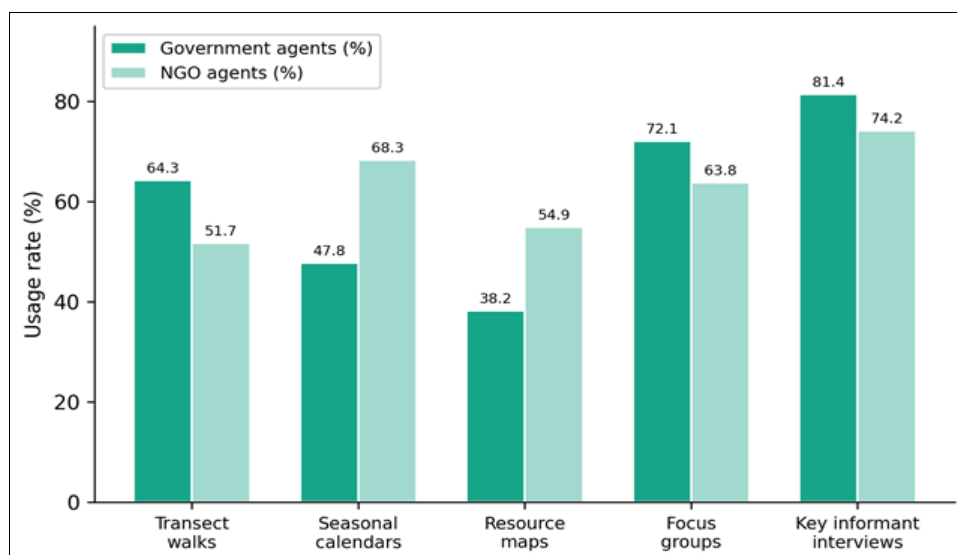


Fig 2: RRA technique usage rates among government and NGO extension agents (%)

Government agents favored interview-based methods (key informants, focus groups), while NGO agents used visual tools (seasonal calendars, resource maps) more frequently.

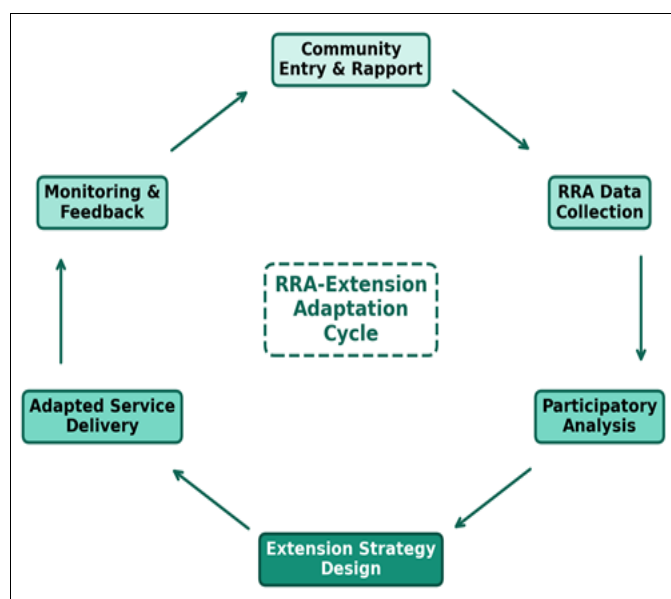


Fig 3: Proposed RRA-extension adaptation cycle linking community entry through data collection and analysis to adapted service delivery and feedback

The six-stage cycle positions RRA as an iterative process within extension planning rather than a one-off diagnostic exercise.

Comprehensive interpretation

Agents who regularly used multiple RRA techniques scored significantly higher on context adaptation. The gap between government and NGO channels suggests that institutional culture and training priorities shape how participatory methods are applied in practice.

Discussion

The heavy reliance on key informant interviews and focus groups among government agent's mirrors patterns reported in South Asian extension systems, where verbal methods are seen as faster and easier to document than visual tools

like mapping or transect walks [6]. NGO agents, often trained in participatory development frameworks, showed a more balanced technique repertoire. This difference likely explains their higher context-adaptation scores, since combining visual and verbal methods produces richer diagnostic information [7, 13].

The large gap in context-adaptation index between regular users (3.74) and non-users (2.41) carries practical meaning: agents who systematically gather local data before designing their programs are perceived-by supervisors and farmers alike-as delivering more relevant advice. Key informants noted that time pressure and heavy caseloads were the main reasons agents skipped RRA steps, not a lack of awareness about their value [14]. Embedding RRA checkpoints into the formal extension planning calendar, rather than leaving them to individual initiative, could address this barrier and

move participatory assessment from optional practice to institutional routine ^[15].

Conclusion

This research shows that extension agents who regularly use RRA techniques achieve measurably better context-specific adaptation in their service delivery. Interview-based methods dominated across the sample, but agents who also employed visual and spatial tools scored higher on adaptation quality. NGO agents outperformed government counterparts on both technique diversity and adaptation outcomes.

For extension organizations in Saudi Arabia and comparable arid-zone agricultural systems, the practical recommendation is to build RRA steps into formal planning cycles rather than treating them as optional add-ons. Training investments should emphasize visual and spatial techniques where the gap is widest. The proposed six-stage adaptation cycle offers a simple framework for structuring this integration without adding excessive workload to field agents.

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Contributions not qualifying for authorship

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