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Government Run vs. University Managed Agricultural Extension: A Review of Nepal, India, and the United States

ABSTRACT

Aims: The creation of an agricultural extension system and its evolution over time is affected by many factors such as history of the country, cultural and community mandates, farming systems, and public policy. There are notable differences in the agricultural extension systems operating around the globe. The purpose of this paper was to review the agricultural extension systems in Nepal, India, and the United States

Methodology: A comprehensive review of literature was conducted to identify the similarities and differences in the agricultural extension systems in the stated countries. Relevant documents included creation legislation for each country, global analysis from organizations such as Food and Agricultural Organization, and peer-reviewed journal articles. The authors' extension experiences working in the stated countries also provided inputs to develop this paper.

Results: Differences were observed in the area of extension models, program delivery, outcomes assessment, and research–extension interface among agricultural extension systems compared in this study. The program delivery mechanism of Nepal and India was mainly driven by 'top down expert model'. Contrary to this, in the United States, extension was operating under a learning model. In all three countries many small scale-farmers felt underserved and disengaged from their extension services. It was found that only small segments of the extension audience were served in comparison to the large number of farmers and their families residing in these countries. In Nepal and India, it was perceived extension agents lacked professional commitment to serve farmers and were mostly accountable to their managers.

Conclusion: Needs were found not–aligned to the extension services offered by all, suggesting a lack of appropriate extension leadership. All the systems need to ensure they are meeting both the perception and realities of their clients. Clients and taxpayers need to feel there is a public value for the extension systems.

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Keywords: Agricultural Extension Systems, Nepal, India, and the United States, Review

1. INTRODUCTION

Agricultural extension can be defined as a service or a system that uses educational processes to assist farmers and their families for improving production practices and raising incomes. It plays a significant role in promoting agricultural productivity, increasing food security, and improving rural livelihoods [1,2].

Due to changing technology, increasing globalization, and transforming cultural and community mandates, agricultural extension has a wider role to play in the 21st century. These include developing human and social capital, enhancing knowledge and skills for

23 production and processing, facilitating access to markets, organizing producer groups, and
24 working with growers toward sustainable natural resource management [3].

25 The creation of an 'agricultural extension system' in a country and its evolution over time is
26 affected by many factors. These include history of the country, cultural tradition, farming
27 systems, public policy, country's need at the time of inception of the extension service,
28 economic capacity to fund the programs, nature of the programs - competing or
29 complementary, and political, social and environmental factors [4,5]. These factors largely
30 determine the structure of an agricultural extension system, research-extension interface,
31 extension agents' training, and services offered to clients.

32 There are notable differences in the agricultural extension systems operating around the
33 globe. Reviewing these differences provides opportunities for learning from each other and
34 exploring ways to identify possible avenues for improved extension services. This paper
35 focuses on the agricultural extension systems in Nepal, India, and the United States (U.S.).
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37 **2. PURPOSE AND OBJECTIVES**

38 The purpose of this paper was to review the agricultural extension systems in Nepal, India,
39 and the U.S. The information gleaned in this article could be useful for policy-makers and
40 extension administrators to identify ways for improved educational services to extension
41 audiences through training, clients' involvement, and policy development.

42 The specific objectives of this study were to review the three countries' agricultural extension
43 systems in terms of the:

- 44 1. History and origin of the agricultural extension systems;
- 45 2. Models of agricultural extension and program delivery mechanisms;
- 46 3. Existing research-extension interface;
- 47 4. Staff trainings and their performance appraisals; and
- 48 5. Current situation and implications for future direction.

49 **3. METHODS**

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52 A comprehensive review of literature was conducted to identify the similarities and
53 differences in the agricultural extension systems in the stated countries. Relevant documents
54 used included creation legislation for each country, global analysis from organizations such
55 as Food and Agricultural Organization, and peer reviewed journal articles.

56 The comparison of agricultural extension systems was further validated with agricultural
57 extension specialists in these countries. Additionally, the authors have a total of more than
58 45 years of combined working experience in the extension systems in Nepal, India, and in
59 the U.S. Their experiences and views provided inputs to develop this paper.
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64 **4. RESULTS AND DISCUSSION**

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66 **4.1 Objective 1: History and origin of agricultural extension systems.**

67 There are not known legislative events, which were the genesis of agricultural extension in
68 Nepal and India. In Nepal, the interest of aristocratic society – Rana Regime - for improved
69 livestock (dairy cows, horses), clover grass, and tea, led to the establishment of an
70 agriculture office in 1921. However, the need for an agricultural extension system as an
71 approach to deliver educational programs nationwide was only noted after 1951 [6,7]. Today,
72 each district has an agricultural extension office.

73 In India, a central department of agriculture was established after the 1866 Orissa famine. In
74 1905, the government of India passed a legislative order to have an agriculture director in
75 each state to advise farmers for better agriculture [8]. As a planned effort during the early
76 post-independence period, India began a community development program in 1952,
77 followed by the national extension service in 1953 [9]. These programs were able to educate
78 farmers to take up improved methods of farming across the country [10]. Today, each district
79 has a department of agricultural extension.

80 Agricultural extension programs in Nepal and India are primarily funded by the national and
81 state governments. To enhance the effectiveness of governments' regular extension
82 programs, international donor supported projects are often also implemented. Therefore,
83 donors' influence in developing extension approaches and policies is important in these
84 countries [11,12]. [13] stated that it is mainly through the influence of donors that the
85 agricultural extension work has been understood in terms of philosophy and framework in
86 emerging countries.

87 Roots of the U.S. agricultural extension go back to the 1862 Morrill Act and the creation of
88 the land-grant university system to 'educate citizens in practical agriculture'. The outreach
89 mission of the land-grant institution was further expanded by the passage of the Smith-Lever
90 Act of 1914, which created the Cooperative Extension Service (CES) manifest through the
91 land-grant university in every state. The mission of the CES is to 'take educational resources
92 of the university to the people where they live' [14]. Today, the U.S. agricultural extension in
93 each state continues to be managed by land-grant universities.

94 Agricultural extension in the U.S. is supported by public tax dollars and the extension
95 audience through formal needs assessment and informal feedback has some influence on
96 the decisions for type of research information and extension services needed. The Federal,
97 state, and local (county) governments jointly fund the U.S. Cooperative Extension Service.
98 This decentralized extension system has an extension office in nearly every county within
99 each state. Although the systems across the U.S. vary, generally the local government
100 provides about one-third of the funding and the other two-third of the funding in extension
101 systems around the country comes through state and federal contributions.

102 **4.2 Objective 2: Models of agricultural extension and program delivery mechanism.**

103 In Nepal and India, the agricultural extension service is run by the ministry of agriculture as
104 one of the public services to farmers and their families. In both countries, the government
105 developed five year plan sets the priorities for extension based on the national strategy as
106 identified by the government. It has been our observation that process of determining
107 priorities is not inclusive or sufficiently participatory of all stakeholders especially farmers. In
108 Nepal, the District Agriculture Development Office with Agriculture Service Centers at the
109 local level implements extension programs. In India, District Department of Agriculture with

110 Mandal agricultural units (comparable to a county in the U.S.) provides extension services to
111 farmers at the local level. In both countries, the agriculture extension work at the grassroots
112 is tied to the national target of agricultural development focused mainly on food security;
113 however, achieving food and nutrition security still remain a challenge [15,16,14].

114 The agricultural extension program delivery mechanism of Nepal and India is mainly driven
115 by 'top down expert model'. The basic concept of extension is to transfer the appropriate
116 technology to farmers and get them adopted [7,17]. In such an approach, farmers do not
117 necessarily share in the research and learning process but are expected to adopt the
118 outcomes of research from stations [18]. In the top-down technology transfer model, the
119 extension system functions as the expert. Extension agents are dependent on the central
120 government administration (ministry of agriculture and/or research stations) for what need
121 to be determined for farmers and lessons to be taught [19].

122 According to [20], most extension professionals in the emerging world assume that they
123 know what farmers want and believe that farmers do not have capacity to identify their needs
124 and make decisions for their own agricultural development. In 2009, [21] observed similar
125 results in Nepal. They found that extension agents did not value or considered farmers'
126 views as important for program development and that farmers often participated in the
127 programs mainly for incentives (such as, seeds and fertilizers) that came with program
128 participation. Authors [22] worked closely with farmers in a participatory watershed
129 management project in Ethiopia. They observed that a successful extension program is only
130 possible through farmers involved at all stages of problem identification, developing
131 solutions, implementing programs, and evaluating the effectiveness.

132 The model of agricultural extension in the U.S. is 'learning', in which extension agents learn
133 from farmers being served, as well as listen and link to research and markets, in setting
134 extension priorities [17]. Under the extension as a learning approach, farmers and extension
135 agents work together to address farmers' needs. This two-way model allows for information
136 and knowledge transfer to occur so that the farmers are informing research based upon their
137 needs and research provides applications back to the agricultural community.

138 The U.S. extension model is a combination of technology transfer, problem solving, and
139 imparting knowledge [23]. Extension work is guided by the principle of 'education for action';
140 therefore the primary focus of technology transfer is to bring educational change in people to
141 achieve knowledge and progress [24]. Today, the U.S. provides agricultural extension
142 services to people in primarily four program areas: agriculture and natural resources; 4-H
143 youth development; family living and nutrition; and community development and leadership.

144 In Nepal and India, program reporting is based largely on 'process evaluation' rather than on
145 'impact evaluation'. Extension agents are focused on reporting number of people attending a
146 program and expenses of the fiscal budget, rather than impact or outcomes of program on
147 the lives of people. The impact evaluation such as determining the change in socio-
148 economic conditions of the community is often limited to the donor supported projects mainly
149 to continue project grants for the following year(s). The traditional agricultural extension
150 program has not shifted its focus to impact evaluation [25]. The reasons are inadequate
151 opportunities for extension agents to improve their evaluation capacities or because their
152 focus is on technical expertise [26] and inadequate attention of the government to commit
153 time and resources for impact evaluation [27,28]. If the opportunity had been provided to
154 agents for building evaluation competence, process evaluation could have been used with
155 good indicators to demonstrate how effectively the programs were implemented, how well
156 participants could learn, and what areas needed to be improved for better program delivery
157 in the future.

158 While planning an extension educational program in the U.S., the federal government
159 mandates extension agents connect evaluation to program design using a logic model
160 framework. Therefore, program evaluation is focused mainly on demonstrating public value,
161 improving program for better practice, and building capacity of extension agents to become
162 good educators [29]. Public value is created when society as a whole finds value in a public
163 service or program - this includes both those who directly benefit from the service and those
164 who do not [30]. However, the authors have observed that there is inconsistency among
165 extension educators to ensure the outcome(s) of an extension program. For example, the
166 same program or curriculum may be offered across a state or region, with differing results.
167 The effectiveness of the presenter, the receptivity of receiving the information/knowledge as
168 well as relevance could impact the outcomes of the programming along with many other
169 factors. Some authors also identified the reasons for inconsistency in reporting program
170 outcomes as educators' lack of knowledge and skills and inadequate opportunities for
171 improving their evaluation capacities followed by their academic training focused on
172 technical content with little emphasis on educational process skills [31,32,33,34].

173 **4.3 Objective 3: Existing research-extension interface.**

174 In Nepal and India, research and extension are governmental entities, independent of each
175 other, have different foci, and are influenced by donors' grant and loan policies. The subject
176 specific front-line extension agents are housed in the district extension offices and the
177 subject-matter specialists are located in the research stations. Due to weak research-
178 extension linkages, research generated information is not always relevant for extension
179 [6,35]. The agricultural universities are not a part of the government's national extension and
180 research network because they are housed under the ministry of education.

181 By its structure, located within the land-grant universities, the U.S. system incorporates both
182 research and extension work under the same umbrella. Extension's input is considered as
183 important for guiding research to generate technology based on the clients' needs and
184 feedback. Subject-matter specialists are located at the land grant universities in each state,
185 and most have joint research and extension appointments, so they may be the same person.
186 This helps to create stronger linkages between research and extension. These specialists
187 provide regular training programs for extension educators as well as private-sector firms.
188 Under the mandate of many state-authorized certifications, the private-sector agricultural
189 advisors are required to complete continuing education and professional training provided by
190 the land-grant universities. This approach ensures that farmers receive up-to-date technical
191 advice from both public extension and private-sector advisors [17].

192 Though, both research and extension works are important to achieve the land-grant
193 mission, many extension leaders in the U.S. noted lack of programming integration between
194 these two entities. Extension professionals often felt that research was highly valued within
195 the colleges and that research colleagues did not show interest in extension's work or
196 understand the purpose of extension. However, it is only through Extension's work,
197 researchers can consider the practical implications of their work in the community [45].

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199 **4.4 Objective 4: Staff trainings and their performance appraisal.**

200 The agricultural extension programs in Nepal and India are implemented by district level
201 extension offices. Extension agents implement programs as their targeted responsibilities
202 assigned by Extension managers. These agents are mainly accountable to their managers,
203 as their manager is responsible for evaluating the performance of an extension agent, not

204 the farmers or any other publicly elected committees, as in the U.S. [36,26]. It does not make
205 much difference to extension agents whether or not they properly implement the program, so
206 long as their managers are happy with them [26].

207 Each extension manager in Nepal and India is accountable to implement the programs as
208 planned and meet the needs of citizens. However, there is lack of appropriate supervision
209 mechanism at the Ministry of Agriculture to make sure that extension managers are working
210 as guided by the national agricultural development plan and policies. The reasons are lack of
211 financial resources, manpower, incentives, and political commitment followed by weak
212 infrastructure for transportation and communication to visit rural areas where programs are
213 implemented. For example Nepal is a landlocked country with 78% hills and mountains. In
214 addition, an important but overlooked factor contributing to the poor performance of
215 extension agents and extension managers in these countries is job safety granted by
216 tenured nature of the job which may result in complacency and sluggishness. This indicates
217 that government needs to strive for standard job performance of extension professionals
218 through policy, training, motivation, and incentives or by other means.

219 According to [26], extension agents in emerging countries have grown up in an environment
220 where there is neither reward for dedicated service to farmers, nor any serious disciplinary
221 action for sluggish performance. As a result, despite the abundant network for agricultural
222 extension from the ministry of agriculture at the central level to agricultural units at the local
223 level, on an average Nepal serves only 15% and India serves only 6% of the farmers and
224 their families [6,37,25]. There are more than 3 million farmers in Nepal [38] and more than
225 119 million in India [39,40].

226 In the U.S., most extension systems have a local county extension advisory committee
227 (elected by the people), which oversees the extension program and determines the program
228 priorities to ensure that needs of citizens are met. This helps to create accountability
229 because Extension agents have direct association with local needs. Typically their job
230 performance is evaluated jointly by the county extension advisory committee and the
231 extension system at the land-grant university.

232 Yet, despite a participatory needs assessment and program design approach in place at the
233 local level, the U.S. agricultural extension system has often also been criticized. The
234 criticisms include: lack of timeliness in response to issues; Extension agents' unwillingness
235 to make recommendations (straddling the fence too much), significant influence in needs
236 identification by the agents resulting in educational programs that are not germane to clients'
237 problems. Thus, clients are often utilizing the expertise of private consultants and firms. For
238 instance, a recent survey conducted in Iowa found that less than one-third of the citizens
239 utilized the services of Iowa State University Extension [41].

240 Small farmers in the U.S. also did not feel extension services met their needs. According to
241 [42], small farmers constitute 91% of all farms and 23% of agricultural production; yet their
242 interests and needs did not align with the services being provided through the county
243 extension services. One of the reasons for this may be that extension agents often use
244 contacts with progressive large farmers as a prime strategy to implement educational
245 programs [43].

246 Small farms are those producers with limited resources including land, capital, skills, and
247 labor. In many communities, small farmers have varied information needs and are seeking
248 educational advice for products being raised under variable circumstances [44,45].
249 Agricultural extension around the world shows similar characteristics in the face of service
250 delivery to small farmers. Authors [46] found that small farms in Latin America, Asia and the

251 Pacific, including Nepal and India, face challenges in the access to extension services and
252 productive resources. They [46] further added that despite the challenges they face to
253 access resources, small farms have proved resilient over time and contributed significantly
254 to agricultural production, food security, and biodiversity conservation. There are more than
255 one million small farms in Nepal, 93 million in India, and 2.1 million in the U.S. [46,47].

256 Many authors [48,49,50] urged agricultural extension services to adopt appropriate methods
257 when attempting to meet the needs of small farmers, which fall outside the “progressive
258 farmer” category. There are powerful reasons to support small farms globally. As stated by
259 [51], they are economically more efficient relative to large farms, can create large amounts of
260 productive employment, reduce rural poverty, support a more vibrant rural nonfarm
261 economy, and help to contain rural-urban migration.

262 **4.5 Objective 5: Current situation and future direction.**

263 For more than a century, the purpose, vision, and values of the U.S. Extension System are
264 guided by land-grant mission -‘practical applications of research based knowledge by the
265 citizen’. After being self-sufficient in food supply for their citizens, the U.S. agricultural
266 extension is now focused on market-driven agricultural production for commercialization and
267 export. It is working towards developing environmental leadership among the community
268 citizens (e.g., [52]) for which, it implements programs that lead to sustainable natural
269 resources such as water quality, crop nutrient management, food safety, organic farming,
270 and application of nanotechnology in agriculture.

271 The U.S. Extension is now geared toward building its capacity to provide agricultural
272 extension services to international communities and meet the needs of global agriculture and
273 food securities. As characterized by small land holding, subsistence farming, and little use of
274 mechanization, Nepali and Indian Extension systems are still focused on meeting the food
275 security needs of people. Agricultural extension in Nepal and India also struggle to depict a
276 best extension approach that meets needs of people at grassroots.

277 With the help of donor supported projects, Nepal and India have been continuously
278 experimenting for an appropriate extension model and have adopted varieties of approaches
279 in their agricultural extension systems. Some of the approaches practiced in the past few
280 decades were training and visit system, integrated rural development, block production
281 program, farming system research/extension, participatory extension approach, pluralistic
282 agricultural extension, farmer field schools, and group approach to extension program
283 delivery. Today, the agricultural extension systems both in Nepal and India are working
284 towards sustainable soil management practices, integrated pest management through
285 farmer field schools, and use of information and communication technologies for disbursing
286 extension information. Most of these projects are supported by international donors.

287 288 **5. CONCLUSION**

289
290 Differences were observed in the area of extension models, program delivery, outcomes
291 assessment, and research–extension interface among agricultural extension systems
292 compared in this study. In Nepal and India, perhaps because of the nature of the evolution of
293 the system and the lack of participatory input from farmers, it has created a top-down
294 approach. Donor input is helping to shape and change that approach. The weak research –
295 extension linkage in both countries resulted in producing information that were not relevant
296 to the needs of clients at grassroots. In the U.S., while there is closer alignment between
297 research and extension, many Extension leaders observed lack of programming integration

298 between these two entities. This might have resulted into a perceived lack of timeliness in
299 meeting the needs of clients.
300

301 In all three countries many small scale-farmers felt underserved and disengaged from their
302 extension services. Needs were also found not-aligned to the extension services offered by
303 all, suggesting a lack of appropriate extension leadership. It was found that only small
304 segment of the extension audience were served in comparison to the large number of
305 farmers and their families residing in these countries.

306 In Nepal and India, extension agents lacked professional commitment to serve farmers and
307 were mostly accountable to their managers. It appears that there is neither reward for
308 extension agents for their dedicated service to farmers, nor any serious disciplinary action
309 for sluggish performance. On the other hand, there was lack of proper supervision by the
310 Ministries of Agriculture to make sure that extension managers are accountable to meet the
311 needs of citizens at the grassroots.

312 All the systems need to ensure that they are meeting both the perception and realities of
313 their clients. Clients and taxpayers need to feel there is a public value for the extension
314 systems. [30] outlined areas that public organization leaders need to address in order to
315 create public value, which [53] categorized as (1) Services - cost effective provision of high
316 quality services; (2) Outcomes - achievement of desirable end results; and (3) Trust-
317 between citizen and extension service provider.

318 319 **IMPLICATIONS AND RECOMMENDATIONS**

320
321 Results of this study have implications for training of extension agents in their role as
322 facilitators and in respecting farmers' experiences for successful agricultural development in
323 stated countries. Findings also suggest the opportunities for all to work in partnership in the
324 area of developing guidelines for reaching small farmers and identifying means to serve
325 increased number of extension audience.

326 A partnership with U.S. Extension system for extension programming, training of extension
327 agents, developing better research-extension interface, and utilizing the resources of
328 publically funded universities in Nepal and India can help to play significant role to improve
329 their extension systems. A strong research-extension linkage helps broaden understanding
330 that how research and extension efforts can be applied for public benefits and community
331 development.
332

333 With a reliable monitoring system in place, India, Nepal and the U.S., need to ensure they
334 are meeting the needs of their extension audience. It is suggested that extension leaders in
335 in India and Nepal, need to strive for standard job performance of extension professionals
336 through policy, training, motivation, and incentives or by other means.

337 **COMPETING INTERESTS**

338

339 There are no competing interests for authors.

340

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