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A Conceptual Framework For Analysis of Communication In Rural Social Systems

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A B S T R A C T

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As Loomis and Beegle[1] and others have pointed out in their analysis of rural social systems, rural life throughout the world tends to be more sacred and less secular, more traditional and less rational, more functionally diffuse and less functionally specific than urban life. Change in such a system, as Becker[2] and Rao[3] and others have illustrated, is related to its communication with other systems. With regard to planned change in rural

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1 Charles P. Loomis & J. Allan Beegle. Rural Social Systems, Prentice Hall, Inc., New York, 1950, p.35.

2 Howard Becker. Through Values to Social Interpretation, Duke University Press, Durham, N.C., 1950, chapter 5 on Sacred and Secular Societies, pp. 248-280.

3 Y.V. Lakshmana Rao. Communication and Development: A Study of Two Indian Villages, University of Minnesota Press, Minneapolis, 1966.

social systems, students with the diffusion process,[4] in the USA and abroad, have described the dissemination and spread of technological innovations with increasing sophistication in various locations throughout the world. Swedish geographers[5] and other social scientists[6] have also contributed.

From the point of view of the change agent -- for example, an agricultural extension educator -- the ability to predict the change which is likely to result from any particular purposeful communication event, or combination of such events, has not developed as rapidly.[7]

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[4] Although the state of this work was brought up to date in 1962 with Everett M. Rogers, Diffusion of Innovations, New York, Free Press, there have been literally hundreds of studies, both in the U.S. and abroad since that time.

[5] See Torsten Hägerstrand, "On Monte Carlo-Simulation of Diffusion," Symposium on Quartitative Geography, University of Lund, Lund, Sweden, unpublished paper, 1960; and, Julian Wolper, "A Regional Simulation Model of Information Diffusion," Public Opinion Quarterly, Vol. 30, Winter 1967, pp. 597-608.

[6] Elihu Katz, et. al. Studies of Innovation and Communication to the Public, Stanford, 1962.

[7] See, for example, Shannon, C.E. & Weaver, W. The Mathematical Theory of Communication, University of Illinois Press, Urbana, 1949; Cherry, C. On Human Communication, Wiley and Sons, New York, 1957; Wilbur Schramm, Ed. The Process and Effect of Mass Communication, University of Illinois Press, Urbana, 1960; David K. Berlo. The Process of Communication, Holt, Rinehardt and Winston, J.H. & Jackson, D. Pragmatics of Human Communication, New York, Norton & Co., 1967.

With the advent of the computer, the opportunity to simulate complex systems and then manipulate the components offers promise of significantly increased precision in such predictions. This could have value not only in predicting outcomes of particular communication events, but in the general management of total agricultural extension education programs.

The complexity of rural society threatens such an exercise, since components at such varying levels as the individual crop, the farm enterprise, the rural neighborhood, the village business, and the government agency continuously interact. To avoid confusion, systematic models can be developed which focus on only one level of analysis at a time, and concentrate on relationships -- on efficiency and effectiveness -- at that level.

In such a systems model (see Miller[8]), made up of components and the linkages among them at any one level of analysis, a change in any component or linkage affects the entire system. Each system has sub-systems within it and supra-systems of which it is a part. Also each component may be looked upon as a system, made up, in turn, of sub-components and linkages.

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[8] James C. Miller. "Living Systems: Cross-Level Hypotheses," Behavorial Science, October 1965, pp. 380-411.

Any rural/agricultural information system -- in a given township, or county, or state, or nation -- can be said to have five major components. These are production, supply, marketing, research, and the extension/education component.

Production includes the tillers of the soil and the managers of farming operations along with the communities of which they are a part.

The supply component consists of the individuals, organizations, and agencies which supply to the production component its inputs, such as seed, fertilizer, pesticides, etc., and the credit or other financial arrangements which make it possible for supplies to flow.

Marketing includes the individuals, organizations, and agencies which receive from the production component that which it produces, and either store, transport, process or otherwise consume it.

Research is the component which studies the operations of the first three, along with possible alternative operations, and generates new knowledge which will be useful to the system.

The extension/education component trains personnel for all other components, and usually also expidites the flow of information among them.

These five components are related to each other

through ten internal linkages, or clusters of channels, which are illustrated in figure 1. Also, each component has linkages with outside systems. Each linkage has a certain capacity for carrying information and a level of fidelity and memory.

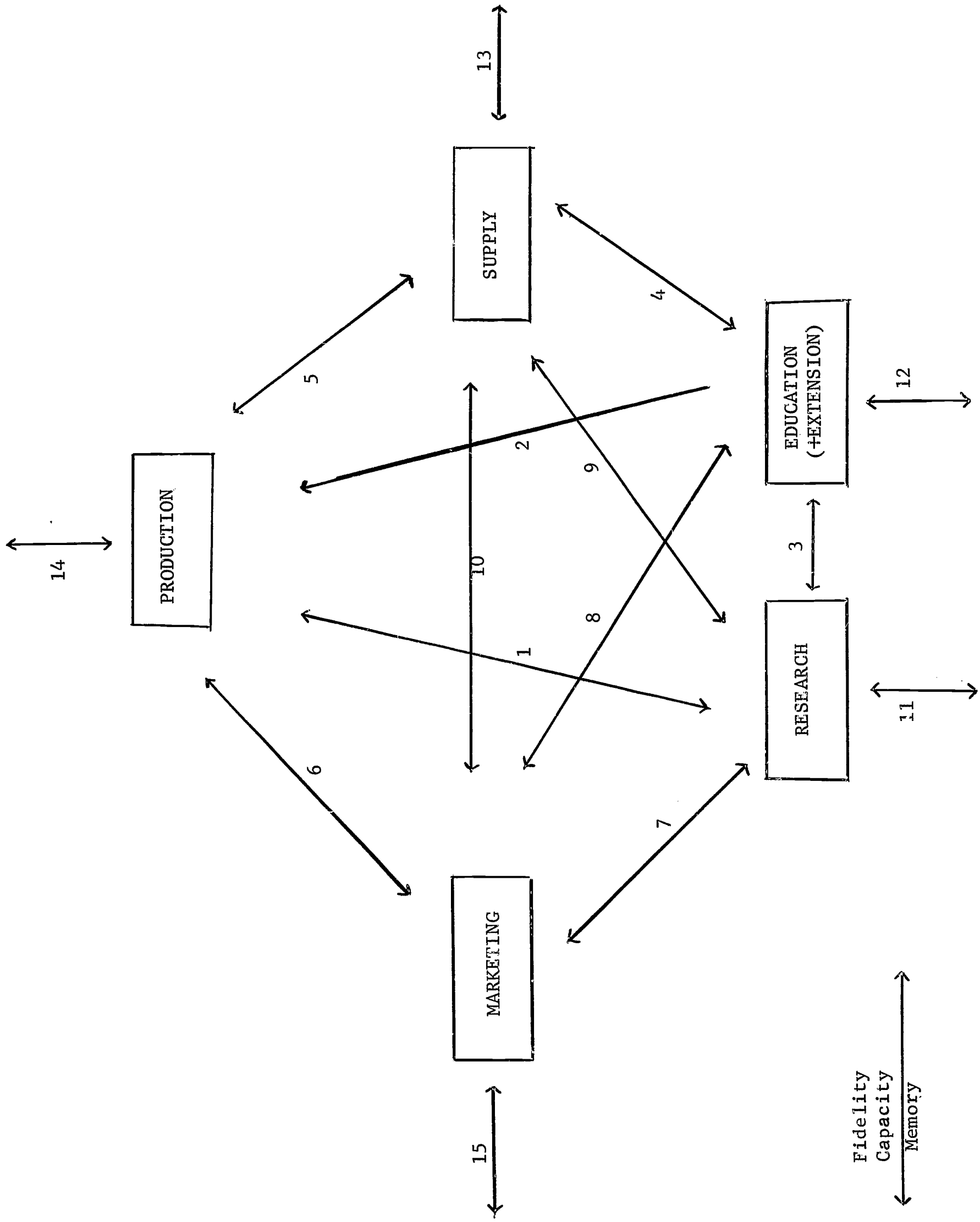
The linkages themselves are made up of a variety of channels, which provide the means via which particular messages are carried from one component to another.

As a conceptual framework for analysis of communication in rural social systems, this model offers a practical approach to highly complex situations and may be used by investigators to avoid overlooking crucial variables. The production component has been the major focus of rural sociological research. Its structure, its processes, its institutions, its population and its ecology have been thoroughly investigated. The supply, marketing and research components have received less attention, although the extension/education component has blossomed during the last decade as research material.

Among the major linkages, that between the extension/education component and the production component has been analyzed in terms of the several channels which it typically includes. But, systematic inventory and description of message systems is rare, and comparative analysis of channels in terms of their capacity, fidelity, and the impact of messages carried via differing channel

Figure 1

Components and Linkages in an Agricultural Communication System



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combinations has not been reported.

In order to grapple with questions of effectiveness and efficiency of communication in rural social systems, several definitions have been developed.

Audience -The audience (sometimes called target system) is the group of people, one individual or many, whose behavior is intended to be changed by receipt of the message. Behavior includes thinking, feeling, and/or action.[9]

Message -The message is a statement of the change to be made by the audience. The message is the intent of the communication.

Channel -A channel is any tool which can be used by a communicator to transmit the message to the audience. It includes such things as face-to-face visiting, a meeting, a tour, a demonstration, a newspaper, a magazine, a printed folder, a poster, an exhibition, a radio program, a telephone.

Treatment -The treatment is the design given to the message as it is used in a particular channel.

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[9] See Ralph W. Tyler. Basic Principles of Curriculum and Instruction, University of Chicago Press, Chicago, Illinois, 1950, for detail categorization of human behavior.

If the message is the intent of the communication, the treatment is the content. Given a particular message for a particular audience on a particular channel, there are an infinite variety of treatments which could be employed.

Impact - The impact is the extent to which the audience has made the change in behavior as spelled out in the message.

The impact of a single communication event may be measured by the formula:

$$Iz = \left(\frac{XZP}{XZO} - \frac{YZP}{YZO}\right) \quad \left(\frac{XZP + XZO}{YZP + YZO}\right)$$

where Z equals a single communication event; XZ equals the portion of the audience exposed to Z and YZ equals the portion of the audience not exposed to Z; O indicates the portion of the audience not making the particular change in behavior specified in the message of Z; P equals the portion making the change in behavior. In percentage terms, XZP + XZO + YZP + YZO always equals one hundred percent.

In narrative form, the impact of a single communication event can be said to vary with the proportion of the audience which is exposed to that single communication event and, in fact, makes the change in

behavior which its message specifies; divided by the proportion of those who are exposed who do not make the change in behavior; minus the proportion of those who are not exposed to the communication event who do, in fact, make the change in behavior; divided by the proportion of those who are not exposed to the communication event who do not make the change in behavior --- all of this multiplied by the proportion of the audience which is exposed to the single communication event divided by the proportion of the audience which is not exposed to the single communication event.

Once the impact is determined, or, if a relative impact score has been developed, the efficiency of any single communication event can be measured by:

$$E = \frac{A \cdot I}{C} - T$$

where E equals efficiency; A equals the number of persons in the audience; I equals the impact; C equals the cost; and T equals the time which has elapsed.

These definitions, along with the five-component system model described above, are offered as a conceptual framework upon which computer simulations of communication in rural social systems may be based, and as a basis for improved management decision by those whose role it is to change such systems.

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