

MALAWI

Strategy Support Program



WHO TALKS TO WHOM? AN ANALYSIS OF INFORMATION FLOWS IN MALAWI'S AGRICULTURAL RESEARCH NETWORK

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A Social Network Analysis (SNA) of agricultural research institutions in Malawi was performed to investigate networking and knowledge sharing in relation to the implementation of the Agricultural Sector Wide Approach (ASWAp). SNA helps explain how the different actors relate to one another, and how these relationships affect the generation, exchange, and use of information and knowledge in ASWAp implementation. The ASWAp is Malawi's Comprehensive Africa Agriculture Development Program (CAADP) compact. It articulates Malawi's ambition to transform and diversify its agricultural sector with the aims of raising agricultural productivity, improving food and nutrition security, and increasing the incomes of rural people.ⁱ Agricultural research plays a vital role in making the programme a success.

UNDERSTANDING SOCIAL NETWORK ANALYSIS

Social Network Analysis (SNA) is a tool to analyze structural patterns of social relationships and provides measures to analyze networks of communication within and between organizations. It helps to identify information pathways, brokers and gatekeepers; and supports processes of knowledge sharing within and between organizations. These insights are of primary interest to research organizations where potential for innovation, creativity, personal expertise can be pooled to create synergies. The pooling of resources is essential for the successful implementation of the ASWAp and for achieving national agricultural development goals.

A number of measures are used in SNA to explain information flows within a network:

- The **density** of a network is the proportion of ties (or relationships between actors), expressed as a percentage, of all possible ties in a network. Density gives insight about the speed at which information is communicated and diffuses among the members of a network.
- **Reach efficiency** indicates effectiveness at reaching a wide audience. It measures how much secondary contact is gained through each unit of primary contact. If reach efficiency is high, then the actor is successful in reaching a wider audience through their primary contact.
- Key indicators that give insights into power and influence of individual members of a network are called **centrality measures**; we focus on two:
 - i. **Closeness centrality** determines a member's integration within a network. It measures the distance of a member to all other members in the network. A higher value indicates the ability to reach out effectively. Lower closeness centrality indicates growing isolation to other members.

- ii. **Betweenness centrality** measures how often a communication node lies along the shortest path between two other nodes. High betweenness centrality helps identify knowledge brokers and gatekeepers.

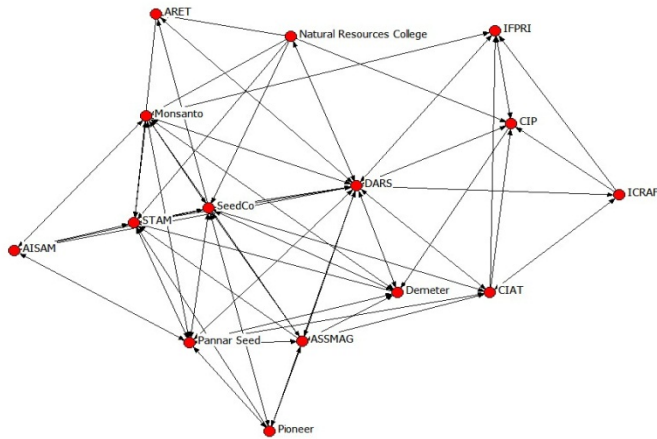
- **Information sending/receiving:** Actors with higher means for information sending imply that they are a source of information and can have influence as a supplier of information. Actors with high means for information receiving gather a lot of information and may exercise influence and power as brokers or facilitators of information.

The SNA sampled sections and units of the Department of Agricultural Research Services (DARS), most CGIAR centers that are operating in Malawi, some private seed companies and seed industry associations, farmer's organizations, and other academic and research institutions engaged in agricultural research. Each of the organizations was asked about its interactions (information sending and receiving) with other actors within the information exchange network. Within the DARS, six separate sections/units were interviewed. These were interviewed separately due to their separate core functions and research mandates. For the SNA, data was analyzed using Ucinet software.

DARS AS A SINGLE ENTITY

Although DARS sections/units were interviewed separately, the first set of results presented (Figure 1) shows DARS as a single organization to illustrate its central position in the flow of information within the Malawi agricultural research network. In this scenario, if any organization had interaction with any DARS section/unit, it is presented as an interaction with DARS as a whole.

Agricultural information network in Malawi – DARS as a single entity



With DARS presented as a single entity, the network has a density of 44.3 percent which indicates the proportion of ties present out of all possible ties linking any two members of the network. The central location of DARS in the network is apparent, and as expected the measures in Table 1 indicate its importance, power and influence. High levels of betweenness and closeness and high means of information sending and receiving all confirm that DARS occupies an influential position. Note, however, that its reach efficiency is relatively low compared to other actors, indicating that it is not very successful in reaching a wider audience beyond its primary points of contact.

SNA measures for agricultural information network in Malawi – DARS as single entity

Actor	Size	Ties	Pairs	Density	Reach efficiency	Betweenness	Closeness	Mean	
								Info. sending	Info. receiving
DARS	14	65	182	35.7	14.6	40.4	100.0	1.00	1.00
CIP	6	14	30	46.7	32.6	8.3	63.6	0.21	0.36
IFPRI-MaSSP	5	12	20	60.0	35.0	10.0	60.9	0.21	0.36
ICRAF	4	10	12	83.3	43.8	0.0	58.3	0.29	0.14
CIAT	7	22	42	52.4	24.6	14.3	66.7	0.50	0.36
SeedCo	11	55	110	50.0	16.7	12.1	82.4	0.71	0.71
Monsanto	9	41	72	56.9	18.7	13.2	73.7	0.57	0.64
Pannar Seed	9	47	72	65.3	18.4	9.8	73.7	0.64	0.64
Pioneer	5	19	20	95.0	26.9	0.0	60.9	0.36	0.21
Demeter	7	31	42	73.8	20.9	6.0	66.7	0.43	0.43
ASSMAG	8	42	56	75.0	19.4	3.5	70.0	0.50	0.50
AISAM	5	20	20	100.0	26.4	0.0	60.9	0.36	0.29
STAM	10	53	90	58.9	18.0	2.2	77.8	0.29	0.71
ARET	4	10	12	83.3	34.2	0.0	58.3	0.14	0.21
NR College	6	18	30	60.0	25.9	0.0	63.6	0.43	0.07

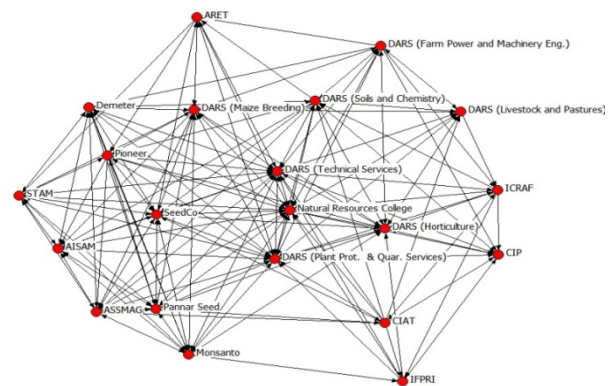
Source: Authors' estimation using Ucinet

DARS SECTIONS/UNITS AS SEPARATE ENTITIES

DARS sections/units are presented as separate entities, the picture changes substantially (Figure 2). At a glance, one can see the increased density of the network, which is confirmed by the network density of 53.3 percent. Two DARS sections/units – Plant Protection and Quarantine Services and Technical Services – play a more central role within the network, and the Natural Resources College (NRC) has moved to a more central position. However, CGIAR centers, private sector companies and industry associations remain on the periphery.

An examination of other measures also confirms the influential roles of the most central DARS sections/units mentioned above. Both Plant Protection and Quarantine Services and Technical Services have very high means for information sending and receiving, and high levels of closeness and betweenness, indicating influential roles in information exchange.

Agricultural information network in Malawi – DARS sections/units as separate entities



SeedCo, Monsanto and Pannar Seed continue to occupy positions of relative influence, as indicated by relatively high means of information sending and receiving, closeness and betweenness. We also see that NRC occupies a significantly more important position in this analysis, particularly as a receiver of information with a high level of closeness. Relatively low means for information sending and receiving for the CGIAR centers, private sector and industry associations confirms their relatively less influential positions within the network.

Another important insight gained from this analysis is the relatively low levels of reach efficiency for some of the DARS sections/units (e.g., Plant Protection and Quarantine Services, Technical Services, Maize Breeding, and Soils and Chemistry) and other organizations (e.g., NRC). This suggests that their networks are not very strong beyond primary points of contact; i.e., information is prone to get “stuck”. At the same time, the CGIAR centers have relatively high levels of reach

efficiency, suggesting that they rely on “friend-of-a-friend” connections.

SNA WITHOUT PRIVATE SECTOR

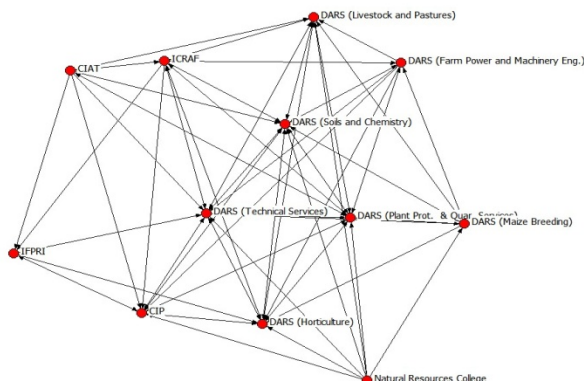
Finally, we looked at the Malawi agricultural research information network *without* considering private sector and industry association groups, leaving only the DARS sections/units, CGIAR centers, and academia. The results are presented in Figure 3.

As in the other analyses, we see the important role that some of the DARS sections/units continue to play, namely, Plant Protection and Quarantine Services and Technical Services. The network density also increased to 58.3 percent. However, we see that the CGIAR centers remain on the periphery of the network, even more so than was seen in the two other analyses. The position of the NRC has also shifted from a more central position to one on the extreme periphery of the network. Of note are the means for information receiving for the CGIAR centers and Natural Resources College. With the exception of the International Potato Center (CIP), they remain very low. For the NRC it has dropped to zero.

Our results suggest that the private sector and industry association groups play an important role, through secondary contacts, in bringing CGIAR centers and academia closer to the center of the network by facilitating information sharing with the DARS sections/units. This analysis shows the importance of full participation of all stakeholders in the agricultural sector.

The SNA confirms the role played by DARS as a central coordinating body and facilitator of information. However, it also shows the important role other actors play to relay information to a wider network of stakeholders. These secondary information pathways can play a very crucial role. The analysis further illustrates that key stakeholders (e.g. CGIAR centers, private sector, industry associations) remain on the periphery of the network. These players need to be better integrated into the implementation of an information and communication strategy for agricultural research in Malawi in support of ASWAp.

Agricultural information network in Malawi – without the private sector



CONCLUSION AND POLICY RECOMMENDATIONS

Although it is clear that several DARS sections/units play important roles in the Malawi agricultural research information network, there is scope to increase efficiency of information exchange and thus contribute to a successful implementation of ASWAp. In the analysis where DARS sections/units are treated as separate entities, only 53.3 percent of possible ties are present in the network. Furthermore, there is evidence that many important players in the system are not fully integrated into the network, e.g., the CGIAR centers, the private sector and industry association groups, and other academic institutions. Many of these network participants are somewhat cut off from the DARS and rely on their own networks (primary *and* secondary contacts) to send and receive information. While the networks of some of these research institutions are not as broad as DARS, in many cases they reach deeper and farther due to their reach efficiency.

These findings show that improved communication and information flows will facilitate ASWAp strategic and operational planning, as well as monitoring and evaluation. Specific recommendations include:

1. Improve communication among research institutions, through:
 - a. Joint planning to support the ASWAp agenda
 - b. Joint seminars by government agencies, CGIAR centers and private sector players
 - c. Regular review meetings with government to evaluate what each research agency is doing
2. Government to take a supportive role in facilitating linkages to exchange information. For this, it might be necessary to establish a liaison office, such as an “ASWAp Partnerships and Liaison Office”. The main role of this office would be to foster partnerships and collaboration of CGIAR centers and other research institutes with public and private institutions, including NGOs. Additional functions include the harmonization of research plans of all agencies involved in agricultural research and monitoring, evaluation, and impact assessment of the research efforts.

It is important that the Ministry of Agriculture and Food Security include the private sector in ASWAp activities to benefit from their specific experience, knowledge, and to interlink with their often quite separate information networks.

References

MoAFS (Ministry of Agriculture and Food Security) (2011) Malawi Agriculture Sector Wide Approach: A Prioritised and Harmonised Development Agenda: 2011-2015. Lilongwe: MoAFS.

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