CASE STUDY

Creation of Empirical Knowledge using ICT Tools for Sustainable Livestock Husbandry: Study Case of Mongolia

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A.   Contextual Issues

Livestock husbandry is a global contributor of socio-economy well-being by ensuring food security nevertheless, highly vulnerable to Climate Change impacts. In Mongolia, massive amounts of livestock die as extreme weather strikes. The simplistic hypothesis of Climate-Livestock mortality alone might be untrue. The
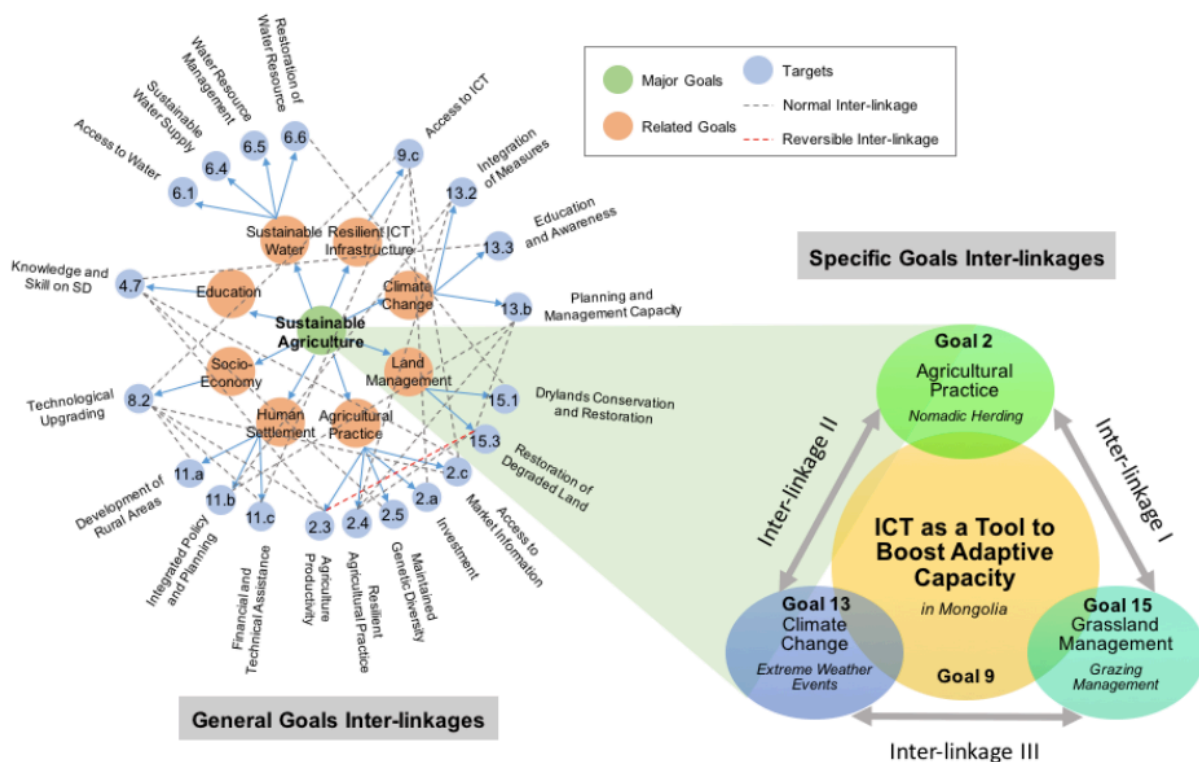

Fig. 1 The interaction mapping on sustainable agriculture

fact is, nomadic husbandry culture is still being practice, the uncontrolled number of animals can lead to the degradation of grasslands. How these various factors interact and inter-linked? We proposed a new system for livestock data aggregation towards creating new empirical knowledge for a sustainable livestock husbandry future.

B. SDGs-based Conceptual Framework

This conceptual framework is proposed to illustrate the inter-linkage between three major elements (Agricultural Practice, Grassland Management, Climate Change) of our research on the generic SDGs canvas. In our research, the major goal is to achieve Sustainable Agriculture. From all 17 Goals in SDGs, 8 Goals (2,4,6,8,9,1,13,15) are selected according to their relevance with our major Goal. Further, all Targets under those 8 Goals are refined and only pertinent Targets are chosen. The inter-linkages between multiple targets are identified by searching and matching common keywords. For instance, Target 13.b has a mutual keyword of "Climate Change" in Target 2.4 and 11.b. Despite the inter-linkages between Goals from global perspectives, normally the environmental issues are uniquely local and case-specific thus, based on available scientific evidence obtained through literature review, the number of Goals to be analyzed have been narrowed down to Goal 2,9, 13 and 15. These Goals are profoundly significant to be analyzed to understand the inter-linkages inside the complex system in Mongolia.
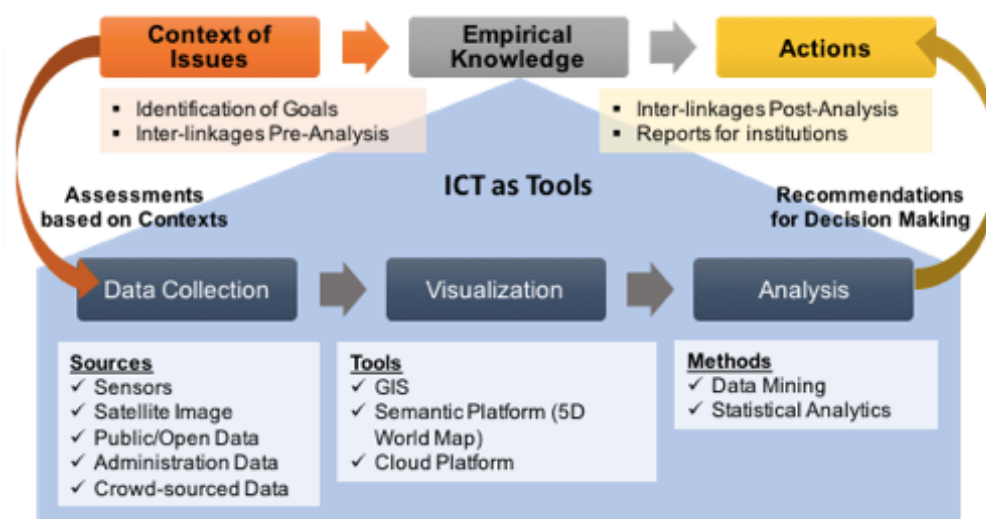

Fig. 2 ICT Tools for driving sustainable livestock

C. Actionable Roadmap Towards Sustainable Development

A generic actionable roadmap is presented as a reference to choose the right steps from understanding the issues to solving the assessments by initiating actions. The first step is understanding the contextual issues, followed by extraction of knowledge and finally, impactful actions. The focal point of this research is the application of emergent ICT tools for knowledge extraction. A preliminary application of the proposed generic roadmap on study case of sustainable livestock husbandry in Mongolia is demonstrated.

5D World Map System: http://133.27.177.31/5dtest/

D. Sustainable Livestock Husbandry through ICT Solutions Study Case of Mongolia
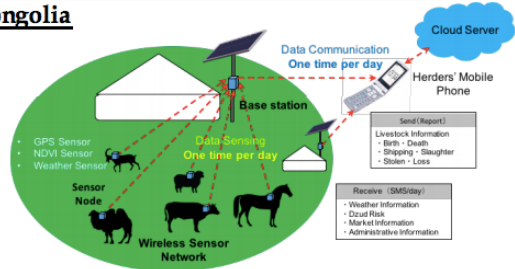
I. Data Aggregation
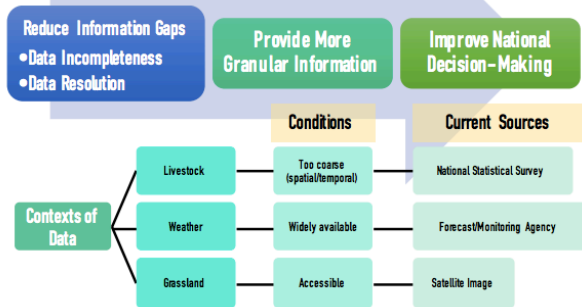
Fig. 3 Data aggregation for livestock statistics data collection
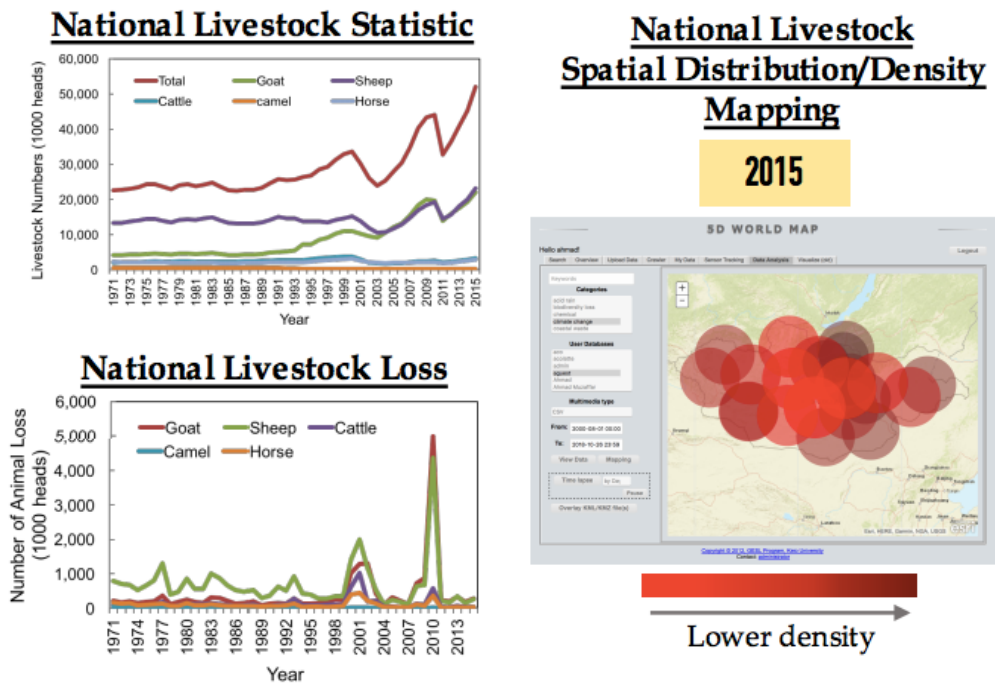
II. Visualization

Fig. 4 Livestock data with geo-visualization on 5D World Map System

III. Analysis

Through measurable parameters and indicators, the interlinkages between various sectors can be analyzed.
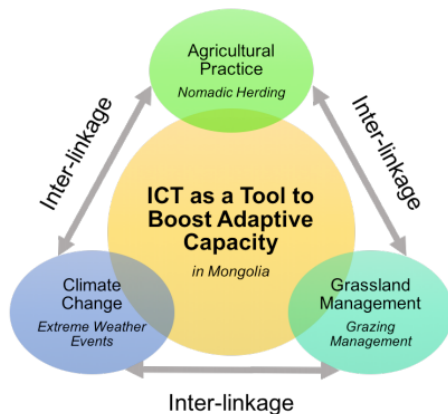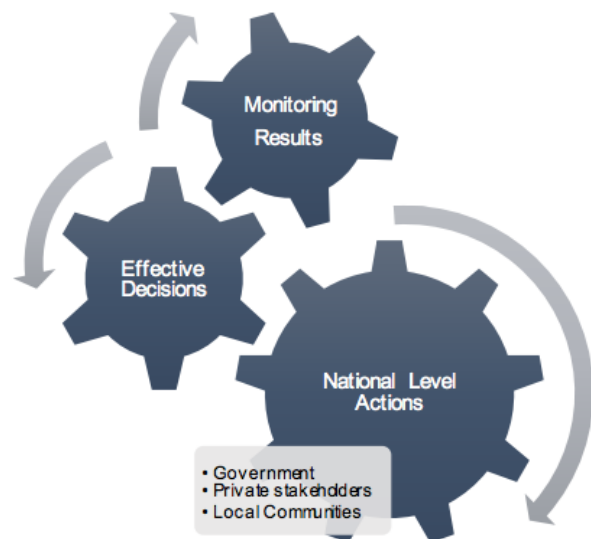

Fig. 5 Analysis and ICT tools

Fig. 6 Decisions and Actions

IV. Decisions and Actions

Localized data is useful to monitor SDGs, even though awareness on SDGs is low. Through high data literacy, empirical knowledge can provide insights for various accountability actors at the national level to make effective decisions and acts at their own roles and capacities.

E. Conclusion

Lack of high resolution spatiotemporal data of livestock causes difficulties to analyze inter-linkage s within the Livestock-Weather-Grassland nexus toward s a measurable analysis. We propose a new digital livestock tracking system, which integrates Wireless Sensor Networks (WSN) and Mobile Communication technology to aggregate high resolution spatiotemporal data of livestock.