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Adaptive Policy Analysis of Drought and Excess Moisture Programmes in Manitoba

2012 Pilot Application

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Adaptive Policy Results Summary

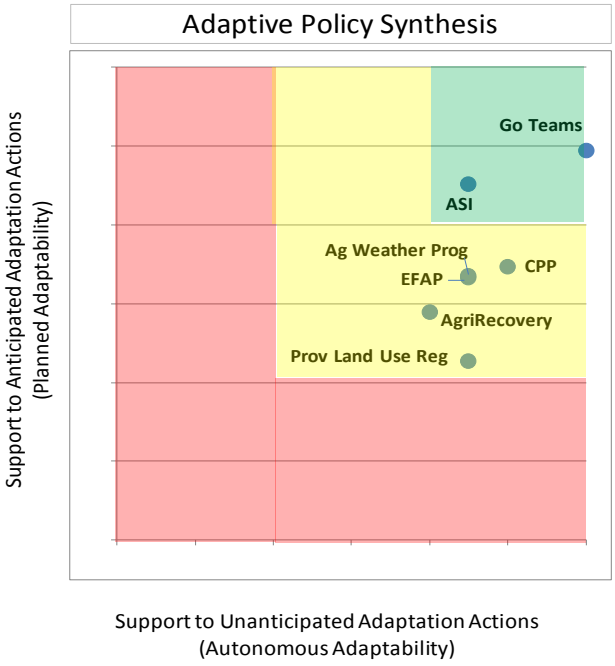
Increased drought and excessive moisture risks are some of the most problematic impacts expected due to climate change for the Prairie region. Ensuring that drought and excessive moisture preparedness programmes are able to positively influence adaptive capacity for exposure to water-related extremes is an important part of climate change adaptation.

In 2012 Manitoba Agriculture, Food and Rural Initiatives (MAFRI) undertook an analysis of seven provincial policies to assess the ability to contribute to both anticipated and unanticipated adaptation needs. A beta version of the Adaptive Design and Assessment Policy Tool (ADAPTool) develop by the International Institute for Sustainable Development (IISD) in collaboration with the Prairie Regional Adaptation Collaborative was used to undertake the analysis. The analysis was performed by both Manitoba government (MAFRI, Conservation, and Local Government) and IISD personnel.

The following seven policies were analyzed: AgriRecovery Program; Community Pasture Program (CPP); Go Teams; Ag-Weather Program; Environmental Farm Action Program (EFAP); Agricultural Sustainability Initiative (ASI); and the Provincial Planning Regulation - Policy Area 3, Agriculture.

As a basis for gauging the ability of the suite of policies to support anticipated adaptation actions, a rapid expert-based assessment was undertaken. A total of 57 vulnerabilities were identified for eight agriculture subsectors, along with 159 anticipated adaptation actions to address these vulnerabilities (see page 9 and Appendix A for details).

Of these 159 anticipated adaptation actions, 137 were supported by at least one policy in the suite. The Go Team program accounts for most of this support. This extension program has broad mandate to respond to a range of needs.



The adjacent diagram presents the relative contributions of each of the policies analyzed in this report to both 'planned adaptability' – the ability to support anticipated adaptation actions, and 'autonomous adaptability" – the ability to support unanticipated adaptation needs. The position along the vertical axis of the adjacent diagram reflects a policy's relative support for anticipated adaptation actions, along with the potential vulnerability of the policy itself to drought and excess moisture; the ability of the policy to contribute to key determinants of adaptive capacity (economic resources, access to technology, infrastructure needs, information and management skills, institutions and networks, and equitable access); and the degree to which the policy consulted with stakeholders during its scoping and design phase. A policy's relative position along the horizontal "autonomous adaptability' axis is a reflection of:

the degree to which stakeholders have input during policy implementation; the ability to enable self-organization through the sharing of best management practices and lessons learned; if the policy is sufficiently decentralized to respond to local adaptation needs; and whether or not the policy has a formal review process to trigger key policy improvements and detect emerging issues.

If a policy appears in the green area of the diagram it is contributing well to both planned and autonomous adaptability. A policy appearing in the red area signifies that there are issues to address with regard to its ability to contribute to adaptation and to adapt itself to the stress of drought and excess moisture. The yellow area signifies that a policy is partially contributing and that some improvements might be warranted to help it better contribute to adaptation needs and be more adaptive itself. It is important to note that these rankings are not an assessment of policy performance relative to their original policy objective and mandate.

As illustrated on the diagram, most of the policies considered ranked as 'partially contributing' (in yellow) to anticipated and unanticipated adaptation needs (including AgriRecovery, CPP, Ag Weather Program, EFAP and the Provincial Land Use Regulation). The Go Teams and ASI policies ranked the highest owing to their overall broad mandate which address many of the anticipated adaptation actions. The Go Teams program ranked the highest with respect to autonomous adaptability owing to its on-the-ground extension service which enables self-organization and networking as well as decentralized decision making.

The overall conclusions and recommendations of the adaptive policy analysis for the suite of policies considered include:

- **Support to Anticipated Adaptation Needs** (planned adaptability)**.** As previously stated, 137 of 159 anticipated adaptation actions are directly supported by at least one policy in the suite of seven policies considered. An analysis of the full suite of drought and excess moisture related policies and programs would help to detect if gaps exist in government support for adaptation needs.

- **Policy Stress** (planned adaptability)**.** Multi-year drought or flooding can pose a threat to the ability of several programmes in achieving their broader mandate, including AgriRecovery, CPP, Go Teams and EFAP. A review of these policies is recommended when successive years of drought or flooding occur to detect which other policy objectives, functions, and services might be suffering from lack of attention.

- **Support to Stakeholder Adaptive Capacity** (planned adaptability)**.** The six determinants of adaptive capacity (economic resources, access to technology, infrastructure needs, information and management skills, institutions and networks, and equitable access), were largely supported by the suite of policies, except in the areas of technological and infrastructure access. In particular, none of the policies examined provide direct support for producers to access relevant technology for adapting to DEM (aside from some support via EFAP). This could be signalling a significant policy gap, if this suite of policies is representative of the broader package of policies relevant to DEM.

- **Use of Multi-stakeholder Deliberation** (planned and autonomous adaptability)**.** The suite of policies has been well informed by multiple stakeholders during their design phase and is well informed by multiple stakeholders during implementation.
- **Enabling Self-organization and Networking** (autonomous adaptability)**.** AgriRecovery, EFAP and the Provincial Land Use Regulation policies could benefit from enhanced mechanisms for sharing of best practices and lessons learned among producers across Manitoba.
- **Decentralization** (autonomous adaptability)**.** The suite of policies is sufficiently decentralized.
- **Variation** (autonomous adaptability)**.** All four categories of policy instruments (economic, regulatory, expenditure and institutional) are utilized among this sampling of policies, indicating that the suite has good diversity in approaches to deal with complexity and uncertainty.
- **Formal policy review and improvement** (planned and autonomous adaptability)**.** Formal review mechanisms overall could be strengthened for most policies with respect to the accessibility of review results and formal triggers for review.

Specific conclusions and recommendations for each policy are provided in Appendix B.

The Adaptive Design & Assessment Policy Tool - ADAPTool

The Adaptive Design and Assessment Policy Tool (ADAPTool) is a Microsoft Excel-based workbook designed to evaluate a suite of public policies and programmes for their ability to contribute to the capacity of key economic sectors to adapt to a specific socio-economic or ecologic stress, such as climate change or market price volatility. A policy's ability to help stakeholders adapt to the stress and the policy's ability to adapt itself to the stress is assessed by answering fifteen questions across four worksheets, as summarized below.

Scope of Evaluation Worksheet:

1) What is the geographic scope of the analysis (e.g., watershed, conservation district, municipality, region, province)?
2) What is the stressor of concern (i.e., drought and excess moisture, market price instability)?
3) What are the policies/programs to be assessed?

Vulnerability & Adaptation Analysis Worksheet (for planned adaptability):

4) What are the main sectors active in the geographic area?
5) In what ways are the sectors vulnerable to the stressor?
6) What adaptation actions might be necessary to address the vulnerabilities?
7) Are the identified adaptation actions supported by the policies/programs?

Adaptive Capacity Analysis Worksheet (for both planned and autonomous adaptability):

8) Is the policy itself vulnerable to the stressor identified?
9) Does the policy enhance the capacity of actors within each sector to adapt (with respect to access to finances, technology, infrastructure, information and skills, institutions and networks, and equitable access)[1]?
10) Was multi-stakeholder deliberation used in the scoping and design of the policy?
11) Is multi-stakeholder deliberation used in the implementation of the policy?
12) Does the policy enable self-organization among affected stakeholders?
13) Is the policy sufficiently decentralized to the lowest and most accountable unit of governance with appropriate resources and capacity?
14) Does the suite of policies utilize a variety of policy instrument types? (e.g. economic, regulatory, expenditure, institutional)
15) Does the policy have a regular formal review process in place that can detect emerging issues?

Synthesis Worksheet

An aggregate ranking of planned adaptability and autonomous adaptability is provided for the overall suite of policies, as well as for each individual policy.

The ADAPTool is based on the book, Creating Adaptive Policies: A Guide for Policy-making in an Uncertain World[2]. Lessons learned during the 2012 application of the ADAPTool are summarized in Appendix C.

[1] Based on Smit et al. (2001). Adaptation to climate change in the context of sustainable development and equity. In J.J. McCarthy and O.F. Canziani, eds., Climate Change 2001: Impacts, adaptation and vulnerability. Contribution of Working Group III to the 3rd Assessment Report of the Intergovernmental Panel on Climate Change.

Scope of the Policy Analysis

The primary stressor of interest in this analysis is climate change. More specifically, increased drought and excessive moisture risks are some of the most problematic impacts expected due to climate change for the Prairie region. Ensuring that drought and excessive moisture preparedness programmes are able to positively influence adaptive capacity for exposure to water-related extremes is an important part of climate change adaptation.

The geographic scope of this policy analysis is the province of Manitoba. The policies analyzed include the following:

Agri-Recovery Program: AgriRecovery is a disaster relief framework and is one of the components of the current suite of Business Risk Management (BRM) programs under Growing Forward. AgriRecovery is a framework that allows federal, provincial and territorial governments to work together on a case-by-case basis to assess disasters (e.g., extreme weather, disease, pests, etc.) affecting Canadian farmers and respond with targeted, disaster-specific programming when assistance is needed beyond existing programs (AgriStability, AgriInvest, AgriInsurance, CFIA, etc.). The funding of initiatives implemented under AgriRecovery is cost-shared on a 60/40 basis with the affected province(s).

Community Pasture Program: The Community Pasture Program (CPP) was developed as part of the federal government's response to the sustained drought of the 1930s as part of the Prairie Farm Rehabilitation Act in 1935. The Act provided for the adoption of methods to secure the rehabilitation of lands affected by drought and the subsequent soil drifting. As of 2007, the CPP encompassed 85 pastures across the prairie provinces comprising 930,000 hectares, which is about twice the size of Prince Edward Island. In Manitoba there are 24 community pastures covering 162,000 hectares. The primary intent of the program is to conserve the land resources, protect it from future deterioration due to poor management during drought, or excessive moisture events, while utilizing the land primarily for the breeding and grazing of livestock. In Manitoba the programme is used mostly by mid to large size operators for economic resilience (MB provincial Ag Crown Lands supports the smaller cattle operators for the same reasons). The CPP accommodates nearly 230,000 cattle per year across the prairies including approximately 52,000 in Manitoba.

Go Teams: The GO Teams are the first point of contact between producers and MAFRI . The teams are experts on a wide range of agricultural issues—everything from crops, livestock, soil conditions and watersheds to small business development, training programs, product development and international marketing. This program is province wide with 11 regions and it is one of the four original MAFRI programs dating back to 1870.

Ag-Weather Program: This initiative provides weather-related information and value-added tools for Manitoba producers. All of the current and archived weather data is available free of charge. The

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[2] Swanson, D. A., and S. Bhadwal (eds). 2009. *Creating Adaptive Policies: A Guide for Policy-making in an Uncertain World.* Sage Publications, New Delhi / IDRC, Ottawa.

Swanson, D. A., S. Barg, S. Tyler, H. D. Venema, et al. 2010. Seven Tools for Creating Adaptive Policies. Technological Forecasting & Social Change 77 (2010) 924–939.

network is made up of approximately 40 automated near real-time permanent weather stations. All of the stations monitor air temperature, relative humidity, rainfall, wind speed/wind direction (at either 2m or 10m heights), and soil temperature (5cm depth). Selected stations also measure shortwave radiation (RF1).

Environmental Farm Action Program (EFAP): The Environmental Farm Action program is a Growing Forward Initiative that supports agricultural producers in reducing identified environmental risks and improving the management of Manitoba's agricultural land. The main goal of the program is to improve the management of water resources and additionally to improve air quality, soil productivity and wildlife habitats. Applications that are submitted for funding are ranked and rated by a committee for their capacity to address environmental benefit of completing the project, the provincial program priorities as well as project planning. This program is cost shared between producers and the federal and provincial governments.

Agricultural Sustainability Initiative (ASI): The ASI provides funding to Manitoba producer groups and provincial commodity organizations to conduct demonstrations or technology transfer projects on environmentally sustainable agriculture practices throughout the province. Its goal is to improve the health of agricultural ecosystems in Manitoba by encouraging adoption of these sustainable agriculture practices. The priority areas eligible for ASI funding are: sustainable forage/livestock management; sustainable crop management; and integrated pest management. Under these priorities, emphasis will be placed on projects related to the following emerging agri-environmental issues: water quality issues relating to agricultural production; ecological goods and services; and increasing efficiency of cropping systems.

Provincial Planning Regulation - Policy Area 3, Agriculture: The Provincial Planning Regulation guides the preparation of development plans and ongoing land use and development decisions. Part 3 of the Regulation comprises nine Policy Areas. Policy Area 3, Agriculture, contains policies to protect agricultural land from conversion to non-farm use. The goals of this Policy Area are: (i) to protect agricultural land for present and future food production and agricultural diversification opportunities; (ii) to promote a strong agricultural sector; to encourage environmentally sound agricultural production and development; (ii) to support a sustainable agricultural industry; to minimise potential land use conflicts; and (iv) to provide clarity on siting considerations of livestock operations.

Vulnerability Analysis

Eight agriculture sub-sectors were selected for the analysis and by using a rapid assessment process with a limited number of experts, the following list of vulnerabilities was identified.

Agriculture Subsector	Vulnerabilities
Beef Cattle	Shortage of feed; Grazing season length; Water quality (impact both on cattle, and on watersheds); Feed quality; Health (Access to water, foot rot); Water quantity/supply; Natural shelter diminished; Manure, compost, and dead stock management (floods)
Forage	Feed quality; Access to the field for harvest and grazing; Length of the grazing season; Loss of stands and legumes due to drowning out; Decreased yields; Decreased soil quality; Heat stress; Early dormancy (length of grazing season); Grasshoppers
Cropping (Annual Grains and Oil Seeds)	Access to the land (for seeding and for harvest); Yield; Quality; Pests & disease (insects and weeds); Increase in summer fallow & unseeded acres; Soil quality - soil blows away; salinity; erosion; compaction; Multi-year crop loss
Forage seed	Access to fields; Disease (e.g., mildew) in forage & bees; No harvest / decreased yield; Field conditions poor due to standing water (loss of forage stand); Reduced bee pollination due to excess moisture; Death of bees due to rainfall; Increased grasshopper population
Hogs	Water quality; Possible feed shortages (less likely because it can be sourced from many places); Barns could flood (possibility of death); Increased energy costs to cool the barns; Slowed growth in pigs (if it is really warm)
Dairy Cattle	Water quality - supply contamination; Water quality - run-off; Heat stress; Barns could flood (possibility of death); Shortage of feed (excess moisture = can't get it off; drought = there isn't any feed); Water quantity/supply; Pests and disease; Manure, compost, and dead stock management (floods); Increased energy costs to cool the barns
Poultry	Water quality - supply contamination; Possible feed shortages (less likely because it can be sourced from many places); Barns could flood (possibility of death); Increased energy costs to cool the barns; Slowed growth in chickens (if it is really warm); Manure, compost, and dead stock management (floods)
Potatoes	Accessing water out of rivers (high or low); Water supply - lack of spring runoff resulting in dry dug outs; Accessing land during floods; Low yields; Pest and diseases; Irrigation water supply

The rapid assessment also identified a list of anticipated necessary adaptation actions for each of the vulnerabilities listed above and these results are detailed in Appendix A.

Adaptive Policy Conclusions and Recommendations

The overall conclusions and recommendations of the adaptive policy analysis for the suite of policies considered are outlined in the tablet below.

Adaptive Policy Questions	Flags	Overall Conclusions and Recommendations for the Suite of Policies
Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.3	
To what extent are anticipated adaptation actions supported by the suite of policies?	0.9	137 of 159 actions are directly supported by at least 1 policy in the suite. The Go Team programme accounts for most of this support. This programme has broad reach capability for supporting adaptation given the nature of its extension service.
Is the policy itself vulnerable to an increase range of the stressor?	1.1	Multi-year drought or flooding can pose a threat to the ability of several programmes in acheiving their broader mandate, including AgRecovery, CPP, Go Teams and EFAP. Recommend review of these policies when successive years of drought or flooding occur to detect which other policy objectives, functions, services are suffering from lack of attention.
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	1.3	None of the policies examined provide direct support for producers to access relevant technology for adapting to DEM (aside from some support via EFAP). This could be signallying a significant policy gap, if this suite of policies is representative of the broader package of policies relevant to DEM.
Was multi-stakeholder deliberation used in the design of the policies?	1.8	The suite of policies has been well informed by multiple stakeholders during their design phase.
Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	1.6	
Is multi-stakeholder deliberation used in the implementation of the policy?	1.6	The suite of policies is well informed by multiple stakeholders during implementation.
Does the policy enable self-organization and social networking?	1.4	Agri-Recovery, Ag Weather, EFAP and the Prov Land Use Regulation policies could benefit from enhanced mechanisms for sharing of best practices and lessons learned among producers across Manitoba.
Is decision-making for policy implementation adequately decentralized?	1.9	The suite of programs are sufficiently decentralized.
Is there adequate variety in the suite of policies and programs directed at the policy issue?	2.0	All four categories of policy instruments are exercised among this sampling of policies, indicating that the suite has good diversity in approaches.
Does the policy have a regular formal policy review?	1.2	Formal review mechanisms overall could be strengthened for most policies with respect to the accessibility of review results and formal triggers for review.

Note: the flags represent scores ranging from 0 to 2. Low scores are flagged red indicating that the suite of policies is not contribution to planned and autonomous adaptability. High scores are flagged green and indicate the suite of policies is contributing to adaptation needs. Scores in between are flagged yellow signifying partial contribution of the suite of policies to overall adaptability.

Specific conclusions and recommendations for each policy are provided in Appendix B.

Appendix A: Results of Rapid Vulnerability Analysis

In what ways is the sector vulnerable to excess moisture and drought?	What adaptation actions might be necessary if excess moisture and drought are more severe in the future?
Beef Cattle	
Shortage of feed (excess moisture = can't get it off; drought - there isn't any feed)	Alternate feeding methods
	Alternate feed sources (e.g. grain pellets)
	Stockpile feed
	Improving feed efficiency through good quality feed and forages
	Promoting rotational grazing
Grazing season length	Improving feed efficiency through good quality feed and forages
	Promoting rotational grazing and maintaining ground cover
Water quality (manure impact both on cattle, and on watersheds)	Nutrient management
	Alternate watering sources
Feed quality (drought)	New varieties of feed
	Alternative feed sources (i.e., grain, pellets)
	Grazing management plan
	Feeding management plan
	Feed testing
	Nutritional monitoring and ensuring supplementation
Health (Access to water & heat stress) (excess moisture - depending on where they are. If in coralls, the cattle are standing in mud - foot rot)	Shading structures
	Transition to different livestock types
	Health (foot rot) through prevention, better feedlot design and feedlot location
Water quality (decreased quality with decreased quantity)	Nutrient management BMPs
	Alternate water sources
	Farmyard runoff control
Water quantity / supply	Well capacity maintenance
	Water storage
Natural shelter diminished - in long run the loss of cover (drought)	Shading structures
	Woodlot management (species)
Manure, compost, and dead stock management (floods)	covering compost facilities
	Farmyard runoff management
	Nutrient management BMPs
Forage	
Feed quality	New varieties of feed;
	Grazing management plan;
	feed testing;
	forage blends,
	use of legumes;
	drainage (excess moisture);
	equipment modification to prevent shattering (dry conditions)

Access to the field for harvest and grazing	Equipment modification (E.g., reducing ground pressure by using oversized wheels on balers)
Length of the grazing season	Different forage species on pasture and hay lands (e.g., Tall Fescue Grass)
	Rotational grazing;
	Managing your carrying capacity;
Loss of stands and legumes due to drowing out	Different forage species on pasture and hay lands (e.g., Tall Fescue Grass)
	Equipment modification (Broadcasting of seed in drowned out areas)
	Improved drainage
Decreased yields	Different forage species on pasture and hay lands (e.g., Tall Fescue Grass, legumes)
	Maintaining ground cover/ rotational grazing / residue management (windrows)
	Improving drainage
	Forage blend
Decreased soil quality	Maintaining ground cover/ rotational grazing
	improving rotations, use of legumes in rotations;
Heat stress	Different forage species on pasture and hay lands (e.g., Tall Fescue Grass);
	irrigation;
Early dormancy (length of grazing season) (drought)	Different forage species on pasture and hay lands (e.g., Tall Fescue Grass);
	maintain ground cover / rotational grazing
Grasshoppers	rotational grazing;
Cropping (Annual Grains and Oil Seeds)	
Access to the land (for seeding and for harvest)	Improved surface and tile drainage
	equipment modifications;
	Flexibility: flexibility in operations and equipment and crop residue management and to make decisions based on conditions - possibly involving equipment modification
Yield	Diversify crops, including specialty crops and increasing rotations
	Flexibility: flexibility in operations and equipment to make decisions based on conditions - possibly involving equipment modification
	Assistance programming; R&D in crop breeding and development.Assistance programming for equipment modification
Quality	Diversify crops, including specialty crops and increasing rotations
	Flexibility: flexibility in operations and equipment to make decisions based on conditions - possibly involving equipment modification and crop storage
	better storage of water on land;
	R&D in crop breeding and development;
	marketing strategies
Pests (insects and weeds) & disease	R&D for herbicide efficacy; adoption of insect control methods currently used in areas where the pests have historically been present
	Flexibility: flexibility in operations and equipment to make decisions based on conditions - possibly involving equipment modification
	Assistance programming
	Information sharing re: cultural control methods - for pest and disease; actions depend on the scale
Increase in summer fallow & unseeded acres	Flexibility: flexibility in operations and equipment to make decisions based on conditions - possibly involving equipment modification;
	inclusion of forage in crop rotation
Soil quality - soil blows away; salinity; erosion; compaction	Erosion controls (maintaining ground cover, shelter belts);
	Diversify crops, including specialty crops and increasing rotations (for salinity);

	Deep-rooted and perennial crops for salinity and compaction
Multi-year crop loss	Assistance programming - staffed by staff that are technically sound;
	Beefed up insurance mechanisms / enhanced insurance,
	alternative sources of income;
	mixed farming (promoting, encouraging as a fall back - for moderate cases);
	and use management;
	water storage
Forage seed	
Access to fields	Maintaining ground cover
	Improved drainage
	Equipment modification - reducing pressure on the ground
Disease (e.g., mildew) in forage & bees	Increase crop rotations;
	Effective and proper timing of fungicide application (more research is needed in this area b/c there are many unknowns due to field conditions)
	For bees (chalk brood -prevalence is increasing due to high relative humidity): research re: the disease itself as well as pesticide options.
	For bees (foliar mould - moisture related): treatment of nests and cocoons (e.g., paraformaldehyde at the beginning of the season)
No harvest / decreased yield	Assistance programming - staffed by staff that are technically
	Beefed up insurance mechanisms / enhanced insurance,
	alternative sources of income;
Field conditions poor due to standing water (loss of forage stand)	Improved drainage
Reduced bee pollination due to excess moisture; Death of bees due to rainfall	Researching artificial pollination
Increased grasshopper population	Forage mix
	Improved pesticide management and varieties
	Border management - a buffer between the ditches and the edge of the field.
Hogs	
Water quality	Water treatment
	Farmyard runoff control
Barns could flood (possibility of death)	Raising barns
	Farmyard runoff control
Increased energy costs to cool the barns	Implementing energy efficient heating/cooling options;
	explore biomass options;
	backup options & temperature management
Slowed growth in pigs (if it is really warm)	Implementing energy efficient heating/cooling options;
	explore biomass options;
	backup options & temperature management

Appendix B: Policy Specific Conclusions and Recommendations

Adaptive Policy Questions	Individual Conclusions and Recommendations	
	AgriRecovery Program	
Programmes Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.1	
To what extent are anticipated adaptation actions supported by the suite of policies?	0.4	This policy provides direct or indirect support to 33 out of 159 anticipated adaptation actions.
Is the policy itself vulnerable to an increase range of the stressor?	1.0	There is some vulnerability - an increase in the frequency in flood and drought related disasters could put fiscal pressure on federal and provincial governments.
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	1.2	This policy contributes to adaptive capacity directly via access to financial resources to stakeholders for recovery. Some review of the recovery assessment framework for alignment with the other six determinants of adaptive capacity would be beneficial
Was multi-stakeholder deliberation used in the design of the policies?	2.0	Yes - the framework was developed as part of a broader set of consultations around the Canadian Agriculture Income Stabilization (CAIS) Program in conjunction with an assessment of crop insurance and Agristability.
Progamme's Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	1.3	
Is multi-stakeholder deliberation used in the implementation of the policy?	1.0	Widespread consultation is not feasible at all levels given the urgency of response required.
Does the policy enable self-organization and social networking?	1.0	While there are strong mechanisms for sharing of lessons learned among provinces and federal government, the sharing of lessons among stakeholders impacted post recovery would be beneficial.
Is decision-making for policy implementation adequately decentralized?	2.0	It is a joint review by provincial and federal governments and includes examination of need with the local stakeholders or famers group. The assessment itself is usually started at the provincial level which is appropriate.
Is there adequate variety in the suite of policies and programs directed at the policy issue?	NA	
Does the policy have a regular formal policy review?	1.0	Formal reviews are undertaken, but not at specificed intervals. A more systemetized time-triggered review would help detect emerging issues (i.e., potential fo increased frequency of disasters)

Adaptive Policy Questions	Individual Conclusions and Recommendations Community Pasture Program	
Programmes Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.1	
To what extent are anticipated adaptation actions supported by the suite of policies?	0.9	This policy directly and indirectly supports 24 adaptation actions that involve livestock and grazing (142 actions in total).
Is the policy itself vulnerable to an increase range of the stressor?	1.0	This program is vulnerable given that the community pastures themselves are vulnerable to flooding and drought conditions. Contingencies are in place, but can be costly.
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	1.4	The policy direclty supports the infrastructure determinent of adaptive capacity and indirectly supports the other 5 determinants.
Was multi-stakeholder deliberation used in the design of the policies?	1.2	It appears that there is sufficient decentralization of authority to local managers to respond to multistakeholder knowledge. However, there is a lack of mechanisms to account for diverse interests across various stakeholders (including federal, provincial and municipal levels, and a variety of sectors and scales). More public engagement is needed with local individual producers and local communities to account for these interests and innovate integrated solutions to policy problems.
Progamme's Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	1.6	
Is multi-stakeholder deliberation used in the implementation of the policy?	1.5	It appears that there is sufficient decentralization of authority to local managers, but more consultation by authorities would not hurt. Also, MAFRI should be the primary author on the Policy and Procedures manual for the Agricultural Crown lands, instead of MB Conservation. As well, there is a real need to rewrite the Provincial Crown Lands act, to give the province more authority to control management of these lands, for agricultural use. MAFRI should co-author this revision to the Act. (These recommendations are made as per conversation with Elaine Gauer)
Does the policy enable self-organization and social networking?	1.5	The medium of communication needs to be reconsidered (not every farm operator or individual producer likes reading, nor uses e-mail/ internet) -- holding public forums for various communication purposes may improve information sharing and social networking (conversation with Elaine Gauer).
Is decision-making for policy implementation adequately decentralized?	2.0	Yes, but more consultation with communities would not hurt (conversation with Elaine Gauer).
Is there adequate variety in the suite of policies and programs directed at the policy issue?	NA	
Does the policy have a regular formal policy review?	1.5	If review documentation was made public, the program would benefit

Adaptive Policy Questions	Individual Conclusions and Recommendations	
	Go Teams	
Programmes Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.6	
To what extent are anticipated adaptation actions supported by the suite of policies?	1.8	137 of 159 actions directly supported due the broad reach and diect contact with producers. This gives rationale for the extension service as an important mechanism for helping stakeholders adapt to change.
Is the policy itself vulnerable to an increase range of the stressor?	1.0	The GO Teams, by nature, attend to local needs. With an increase in range of stressor it can cope by providing the necessary information and tools to clients, however it also puts on hold any other projected objectives for the year.
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	1.5	The GO Teams core function is to increase capacity within producers through relevant information to their specific needs. Though it may not directly provide technology, funding or other assistance, by informing them where and how to access these other tools, the producer have better understanding and know-how on where/how to obtain other necessary support.
Was multi-stakeholder deliberation used in the design of the policies?	2.0	The GO Teams change the deliverance of the program to correspond to their clients needs and interests. As one of the oldest programmes within the agricultural sector, the foundation of the programme is direct client input.
Progamme's Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	2.0	
Is multi-stakeholder deliberation used in the implementation of the policy?	2.0	The GO Teams change the deliverance of the program to correspond to their clients needs and interests. As one of the oldest programmes within the agricultural sector, the foundation of the programme is direct client input.
Does the policy enable self-organization and social networking?	2.0	Through information sessions and workshops provided by the GO Teams, producers are enabled to congregate and discuss mutual interests. GO Team staff are also active members of independent producer groups, further enabling self-organization and social networking to have access to relevant information.
Is decision-making for policy implementation adequately decentralized?	2.0	Yes, there is no head office and all 11 districts have decision making powers.
Is there adequate variety in the suite of policies and programs directed at the policy issue?	NA	
Does the policy have a regular formal policy review?	2.0	Yes, annualy the Advisory Council provides a review to the GO Teams on their annual performance and also delivers input in terms of needs for future implementations. These suggestions are later integrated into the programme's strategic planning process.

Adaptive Policy Questions	Individual Conclusions and Recommendations Ag-Weather Program	
Programmes Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.4	
To what extent are anticipated adaptation actions supported by the suite of policies?	0.8	The ag-weather program does not directly support many adaptation actions; however, the program does indirectly support most of the adaption actions identified for the various ag sectors. Therefore, this low score should not be taken as a weakness of the Ag-weather program. 120 of 159 indirectly supported as this is a foundational info system
Is the policy itself vulnerable to an increase range of the stressor?	2.0	The Ag-Weather program itself is not vulnerable to an increase range of drought or excess moisture, unless provincial funding for the program is cut, which means many other programs will also be on the chopping block.
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	0.8	The ag-weather program provides important weather and climate information to producers. It is not intended to provide financial resourcers to farmers.
Was multi-stakeholder deliberation used in the design of the policies?	2.0	The Ag Weather Program was designed with input from a wide range of stakeholders in the agriculture sector.
Progamme's Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	1.4	
Is multi-stakeholder deliberation used in the implementation of the policy?	1.0	Vital input in how the program operates is provided in how the program operates is provided by producers and industry; however, there may be value in creating a formal focus group that meets annually to discuss potential improvements to the program.
Does the policy enable self-organization and social networking?	1.5	Mike speaks at extension events. The program facilitates sharing of information through annual publication of weather maps in a Yield Manitoba, a highly utilized publication that records grain yields across the Manitoba, and also through interviews that Mike does with media outlets.
Is decision-making for policy implementation adequately decentralized?	2.0	Adequately decentralized, but there may be room for formal recognition of current decentralized approach.
Is there adequate variety in the suite of policies and programs directed at the policy issue?	NA	
Does the policy have a regular formal policy review?	1.0	While an annual formal review is required as part of Growing Forward reporting requirements, the Ag Weather program may benefit from implementation of a separate MAFRI formal review process.

Adaptive Policy Questions	Individual Conclusions and Recommendations Environmental Farm Action Program	
Programmes Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.3	
To what extent are anticipated adaptation actions supported by the suite of policies?	0.5	23 of 159 actions directly supported by this program and another 37 indirectly supported. EFAP provides direct support to adaptation actions related to water quality or nutrient management planning. Other adaptation actions related to biodiversity, water storage, and alternative feeding are also in part supported by the program. The potato sub sector is not highly supported by the project however this is not a weakness for the program because one of the targets of the program is to minimize the impact of livestock operations on water quality. The program has categories targeted to each of the subsectors but it is more accessible to the livestock operations versus crop operations.
Is the policy itself vulnerable to an increase range of the stressor?	1.0	EFAP is somewhat vulnerable to an increase range of drought and excess moisture. If producers are focused on the stressor they may not have sufficient time to complete projects. In this case more flexibility in timelines for project completion may be necessary
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	1.5	The program contributes to all six determinants of adaptive capacity
Was multi-stakeholder deliberation used in the design of the policies?	2.0	Stakeholder meetings were held prior to the implementation of the program - produers, producer groups, etc.
Progamme's Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	1.5	
Is multi-stakeholder deliberation used in the implementation of the policy?	2.0	Although multi-stakeholder deliberation is applied during implementation there could be improved selection of projects through multi-stakeholder evaluation of EFAP applications.
Does the policy enable self-organization and social networking?	1.0	A possible method to increase communication between producers regarding beneficial management practices would be do incorportate completed projects into extension material to demonstrate how the change in management practices benefited the farm operation.
Is decision-making for policy implementation adequately decentralized?	2.0	Prior to growing forward this program was administered by the federal government, now when problems arise instead of having all the inquires go to one office in Regina they go to their local MAFRI office or BMP lead for the province. The reaction time is much quicker regarding concerns from producers.
Is there adequate variety in the suite of policies and programs directed at the policy issue?	NA	
Does the policy have a regular formal policy review?	1.0	Although there is no formal review, there was ad hoc review meetings with mutliple stakeholder groups. Additonally, MAFRI meets with Keystone Agriculture Producers (KAP) quarterly to discuss issues surrounding the program. The major review process was completed this year to inform suggested changes to the program for the next round of growing forward.

Adaptive Policy Questions	Individual Conclusions and Recommendations	
	Agricultural Sustainability Initiative (ASI)	
Programmes Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.5	Promote the use of climate risk assessment in ASI programming, evaluation criteria and selection process to strengthen potential outcomes of funded projects
To what extent are anticipated adaptation actions supported by the suite of policies?	1.8	144 of 159 anticipated adaptation actions directly supported by this program
Is the policy itself vulnerable to an increase range of the stressor?	1.0	Increase support for dissemination and application of adaptation knowledge products, tools and methods to current and future ASI-funded projects.
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	1.3	Enhance awareness and capacity of targeted groups to integrate climate change adaptation into project planning and development using a risk-based decision-making framework
Was multi-stakeholder deliberation used in the design of the policies?	2.0	Strengthen organizational viability of targeted groups to mobilize internal and external resources and maximize opportunities for both climate adaptation and mitigation
Progamme's Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	1.4	Enhance existing mechanisms for greater stakeholder input and participation in the design and monitoring and evaluation of ASI projects
Is multi-stakeholder deliberation used in the implementation of the policy?	1.5	Undertake periodic (annual) consultation with targeted groups to generate input and feedback on program implementation
Does the policy enable self-organization and social networking?	1.8	Increase support for documentation and sharing of tools and information, including best practices and lessons learned from ASI funded projects and other adaptation-related initiatives using multi-media approach (internet, TV/cable, radio, and print)
Is decision-making for policy implementation adequately decentralized?	1.5	Explore ways to link stakeholder assessment and feedback to the formal review process
Is there adequate variety in the suite of policies and programs directed at the policy issue?	NA	
Does the policy have a regular formal policy review?	1.0	Engage stakeholders on ASI program review and evaluation and share results publicly to facilitate further replication and scaling up of best practices and dissemination of lessons learned; Update website information, develop and disseminate information, education and communication materials; Engage stakeholder groups in the review process

Adaptive Policy Questions	Individual Conclusions and Recommendations Provincial Planning Regulation - Policy Area 3: Agriculture	
Programmes Ability to Support Anticipated Adaptation Needs (Planned Adaptability)	1.0	
To what extent are anticipated adaptation actions supported by the suite of policies?	0.3	42 of 159 actions are indirectly supported; but only these are land-use related, which is why the Policy Area does not hit many of the actions. This gives helpful information about the type of adaptation actions that the Policy Area supports (water quality; length of grazing season; yield; crop quality; pests and disease; soil quality; multi-year crop loss; flooding of barns; manure, compost and dead stock maangement; and to some extent, health, feed quality and water supply)
Is the policy itself vulnerable to an increase range of the stressor?	1.0	The Policy Area itself is not vulnerable to an increase range of drought or excessive moisture. However, its application may be vulnerable (see previous page).
Can the existing suite of programmes enhance the capacity of actors within each sector to undertake anticipated adaptation actions?	0.7	The policy is intented to enable all Manitoba municipalities to protect Agricultural land as part of their land use activities, and to be applied with flexibility as needed.
Was multi-stakeholder deliberation used in the design of the policies?	2.0	Yes. The policy was developed as part of the regulation with broad, province-wide consultation.
Progamme's Ability to Enable Sector Responses to Unanticipated Events (Autonomous Adaptability)	1.5	
Is multi-stakeholder deliberation used in the implementation of the policy?	2.0	The policy is used to guide individual municipal development plans, which involves multi-stakeholder deliberation at the local level.
Does the policy enable self-organization and social networking?	1.0	In a sense it does because it applies to all Manitoba municipalities, but there is no requirement to share or copy - not really that type of instrument.
Is decision-making for policy implementation adequately decentralized?	2.0	Yes, because the Policy Area is to be used by local planning authorities when preparing a Development Plan for their own locality or region. Once adopted, it replaces the province-wide Provincial Planning Regulation. However, Policy Area 3 does not have a direct impact on the speed with which the stakeholders will be able to respond to an unanticipated event.
Is there adequate variety in the suite of policies and programs directed at the policy issue?	NA	
Does the policy have a regular formal policy review?	1.0	This policy itself does not. The Regulation as a whole was recently reviewed and adopted less than a year ago, so another review will not occur for several more years. However, like any regulation, it is subject to change as needed. Development Plans themselves ahve a built-in review process, receommended every five years.

Appendix C: Lessons Learned in the ADAPTool 2012 Application

Observations from analysts following the 2012 application of the ADAPTool include:

- The tool allowed me to identify several potential weaknesses of the program I reviewed, and suggest ways to strengthen the program.
- Because the tool was originally designed to evaluate programs and policies, rather than regulations, I wasn't sure it would really work in our case. However, I was surprised at how applicable it was, once we got thinking and talking about it. Having the opportunity to discuss the links between the policies and the questions with colleagues was helpful.
- It seems that the Agriculture Policy Area of the Provincial Planning Regulation does have some policies that may hinder adaptation. I don't think we would have understood that without going through this process.
- The main issue that I had with the tool was knowing whether to mark something as a 0 a 1 or a 2. For the EFAP program some of the vulnerabilities are addressed by the BMPs, but because that program is mainly focused on water quality, the way the applications are ranked and rated the application may not get a very high rating based on the rational for completing the project. Even though the issue may be addressed, if there is no way that the project will be funded how do we rank it as 0, 1 or 2.
- A follow up interview to validate initial results and collect data gaps is important to ensure the quality and completeness of the research results. It takes more time and effort to apply this tool to comprehensive/complex programs that are multi-year and cross-cutting sub-sectors/themes. The preliminary identification of associated vulnerabilities and adaptation actions by the team facilitated the process.

The recommendations for improvement made by analysts in the 2012 ADAPTool application include:

- Some policies can actually hinder an adaptation action. The tool could be improved to detect this perhaps by adding a column where you could indicate a negative score.
- Just because a program scores 0 in a certain area (i.e. not supporting an adaptation action, or not promoting adaptive capacity in a certain area, etc) doesn't mean there is anything wrong with the program, it just means the program doesn't contribute to adaptive capacity in that specific area. This should be clarified in the analysis tool and in the conclusions section.
- While challenging to coordinate, a face-to-face sit down session with two contact people who are familiar with the program in question, to systematically go through all the adaptation options and all the adaptive capacity questions could improve the quality of the feedback compared to separate telephone interviews.
- Even though we could apply the tool to the regulation, maybe some questions could be tailored so they would apply more readily to something like a regulation. The tool could then have two or more sets of questions, with the user providing answers depending on what is being evaluated.
- Another problem that I had was trying to figure out if a vulnerability was addressed in one way by a BMP, but is very situation specific, do we give it a 1? We don't want to show that we currently have higher adaptive capacity than we actually do. It may be better in these cases to allow for 0.5 scores.

- It would be a good idea to have a group of people familiar with the policy completing the vulnerability assessment part to eliminate a little bias.
- The tool is relatively simple/easy to use (user-friendly) especially with the Excel scoring system, but if applied at the municipal/local level, it might require training especially for those with limited capacity. A simplified "how-to-do-it" guide would be helpful if the tool is applied at that level. A multi-disciplinary team approach would work at this level.
- On Question #7, in addition to the justification for the rating on whether adaptation options are supported by the policy/program, the identification of critical gaps and barriers to the implementation of identified adaptation options would be helpful. This would provide a basis for developing recommendations for the Synthesis and Recommendations worksheet.
- On Question #9, there might be a need to elaborate more on the six determinants of adaptive capacity using a range of outcome indicators - e.g., access to financial resources may include: access to partial/full government funding support; ability of producer/commodity groups to generate own or external /private resources to support specific projects; and ability of those groups to sustain projects without external funding on a long-term basis, etc..