QUEENSLAND FARMERS' FEDERATION

SUBMISSION TO OFFICE OF CLIMATE CHANGE – CLIMATE CHANGE: ADAPTATION FOR QUEENSLAND ISSUES PAPER 20 OCTOBER 2011

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Queensland Farmers' Federation (QFF) is the peak body representing and uniting 16 of Queensland's rural industry organisations who work on behalf of primary producers across the state. QFF's mission is to secure a sustainable future for Queensland primary producers within a favourable social, economic and political environment by representing the common interests of its member organisations'. QFF's core business centres on resource security; water resources; environment and natural resources; industry development; economics; quarantine and trade.

Our goal is to secure a sustainable and profitable future for our members, as a core growth sector of the economy. Our members include:

- Australian Prawn Farmers' Association,
- CANEGROWERS,
- Cotton Australia,
- Growcom,
- Nursery and Garden Industry Queensland,
- Queensland Chicken Growers Association,
- Queensland Dairyfarmer's Organisation,
- Queensland Chicken Meat Council,
- Flower Association of Queensland Inc.,
- Pork Queensland Inc.,
- Biological Farmers of Australia
- Fitzroy Food and Fibre Association,
- Pioneer Valley Water Co-operative Limited,
- Queensland Aquaculture Industries Federation,
- Central Downs Irrigators Limited, and
- Burdekin River Irrigators Area Committee

Climate Change: Adaptation for Queensland Issues Paper

QFF acknowledges that climate change poses an enormous challenge for all Queenslanders and the industries on which they depend. It is already evident that Queensland's climate is changing and that many aspects of everyday life in Queensland are also being altered by these changes. However, it is important to make a clear distinction between what activities are being altered by the climate itself, and what has changed as a consequence of government policies and programs that are aimed at addressing the deleterious effects of climate change, and general community attitudes to these changes.

QFF regards it as vitally important that Queensland pursue the best possible Climate Science and it be fully engaged with the economic drivers of the state. It is self-evident that Queensland depends on industries that are highly dependent and responsive to climate in our tourism, recreation and primary industries. It is equally important to acknowledge that our economic wellbeing is closely aligned with the mining and resources sector, particularly the exploitation of our vast coal and gas reserves. These economic drivers are highly dependent on the critical linkages that exist because of Queensland's need for efficient water and energy sources to support those industries and the wider community.

Queenslanders are also acutely aware that we live in a highly variable and at times a highly dangerous climate. It is against this background that QFF remains committed to assisting the Queensland government to continue to develop both our climate science capabilities and appropriate public policies and programs to deal with the challenges of climate change.

Climate Science

1. ***Do you feel well informed about the risks that climate change poses to your community?***

QFF believes that regional communities and industries still require a wider and better understanding, knowledge, skills and practical plans to cope with climate risks, both those associated with seasonal variability and the inter-decadal climate changes. Queensland's intensive agricultural industries see climate risk management as a continuous work-in-progress as the "skill" involved with seasonal forecasts and climate change scenarios improves, providing individuals and groups with more substantive information on which to make decisions about adaptation and mitigation measures.To that extent in our assessment primary industry peak bodies are informed about climate change issues at the state scale but there are multiple gaps in our knowledge about risks at a practical decision making scale at the individual business or commodity level.

2. ***Are there any specific areas of climate change science research that the Queensland Government should be undertaking or enhancing?***

QFF members believe that their farmer members can get better results for their regional or commodity specific action plans if there is an overarching Queensland project dedicated to keeping the climate science current, relevant and sufficiently disaggregated to enable regionally based intensive agriculture activities to define the challenges and opportunities facing them with reasonable accuracy (probabilities).

3. ***What areas of climate science need better communication?***

Understanding future farming and potential landscape management options and practical uptake of strategies for dealing with climate change would allow farmers to improve their strategic business decisions. This would also aid in the acceleration of climate change adaptation, to develop resilient profitable and a competitive farming industry.

4. ***How can we make the modelling of Queensland's future climate more relevant for you?***

Queensland primary industries require appropriate cutting edge climate change modelling that can be downscaled to a level that makes sense for consideration of future management options to an individual enterprise. In doing so we need to recognise that the scale associated with recent advances in model selection and downscaling may not match the scale needed by a major farming enterprise. There needs to be a comprehensive evaluation of the future of farming landscapes and possible opportunities for alternate land uses using climate and crop/livestock models ground-truthed in a working farming situation in Queensland. Expected outcomes of future modelling work include the development of robust adaptation strategies related to long-term viability, sustainability and manageability for future farming in Queensland.

QFF believes that improved modelling frameworks are required integrating models such as Agricultural Productions Systems Simulation Model (APSIM) and AussieGrass, with weather and climate information, to aid in practical decision making.

Human Settlements

QFF anticipates that other stakeholders will comment on this section in more detail. Please note that the intensive agriculture sectors are monitoring the climate change implications for human settlements and would like to be engaged in further discussions.

In relation to land use planning the protection of valuable agricultural land will increase in importance, particularly if climate change reduces the available area of arable and productive land.

Planning decisions in the meantime will need to be based on the best information available. The establishment of an effective and timely method of communicating developments in predictive models to planning decision makers will be an important step in managing these risks.

Investment is required in programs that provide land use planners the best possible information to ensure appropriate development and the protection of valuable arable land.

1. ***How can we better empower local communities to plan for, live with and manage climate change risk to human settlements?***

2. ***What more can be done to ensure climate resilience is a key feature of our urban fabric?***

3. ***What are the risks and risk factors that influence the capacity for stakeholders to develop or take up adaptation mechanisms on the ground?***

4. ***What tools, strategies and mechanisms are needed to facilitate effective adaptation to climate change despite if and considering the uncertainties about the timing and extent of impacts?***

Infrastructure

1. ***How should the Queensland Government improve adaptation of infrastructure that is privately owned?***

Agriculture relies heavily on on-farm infrastructure such as buildings, emergency energy supply, telecommunications, water storage, private roads, bridges, fencing, marine and estuary structures etc. More severe rainfall events, increased temperatures, and more severe storms will require a design and construction response if infrastructure is to be constructed and maintained at a standard that prevents loss and interruptions in the supply chain.

2. ***Where do you see the vital connections between infrastructure sectors and systems that could lead to cascade failures if impacted by the climate risks identified in the issues paper?***

The security of service infrastructure is vital in many agriculture industries. For example, prolonged interruption to the electricity supply poses significant challenges for the dairy, horticulture and intensive animal production industries. This is generally the case for any industry that has the need to maintain energy supply for animal welfare needs or the maintenance of perishable fresh produce awaiting transport to markets. An increase in the duration and/or frequency of interruption may require farms implementing expensive back-up systems to protect production.

3. ***Do you have any other suggestions for protecting critical infrastructure in Queensland?***

Investment is required in infrastructure design and construction that minimises supply chain and essential service interruptions. This design should take into account planning for emergency supplies e.g. access to local generator supplies and backup plans for ensure movement of animal feed and fresh produce e.g. contingency planning for freight routes of last resort.

Ecosystems

1. ***What key information gaps must be addressed to inform Queensland's response to climate impacts on ecosystems and biodiversity?***

QFF believes that if Queensland is to succeed in its response to climate change; it will need to address the following *(as detailed by Australia Governments'- Australia's*

Biodiversity Conservation Policy 2010-2030; by the National Biodiversity Strategy Review Task Group):

a) Recognition of biodiversity values and ecosystem services;
b) Recognition of indirect effects of farm activities on biodiversity values and ecosystem services;
c) Perceived cost of these activities to restore degraded lands; and
d) Economic, social pressures and incentives to bring about change to degraded farm landscapes.

There is always an overlap of regulatory responsibilities between Federal, State and local jurisdictions, due to the complex nature that surrounds environmental protection, water resources and land-use management. This is particularly true on issues that cut across state borders, such as water and they therefore lend themselves to be dealt with at a national level.

The Queensland Government should take the lead role in designing and implementing NRM planning that targets the four main criteria above. The plans need to incorporate the climate change pressures, make the best use of the land for the stakeholders concerned and add to rather than detract from, the State's natural environmental assets.

2. Does the projected scale of climate change impacts on biodiversity warrant significant changes in biodiversity management, such as adopting a triage approach?

QFF agrees with the principle that funding should be directed where it is most required (i.e. the areas of the landscape that are most degraded). However, it is also important that any policy is not influenced by short term agendas that do not meet the longer term strategies for the sustainability of the ecosystems affected. The areas concerned should be rigorously researched and quantified by peer review science; to advocate a detailed analysis of the rehabilitation process that is to occur for the landscape that is under review.

For many years the QFF has advocated for the recognition of a property scale Farm Management System (FMS) approach to property management. The voluntary FMS approach allows a farmer to take a look at their own farming operation implement an appropriate risk management framework and work to deliver farming practices that mitigate risks to the natural environment while maintaining farm viability. A profitable farming business is one that can proactively invest in not only environmental stewardship but also environmental rehabilitation.

With the potential loss of habitat values a key risk the issues paper needs to further explore and emphasise the importance of the integration of biodiversity into natural resource management projects. QFF regards the development of the recent QLD Biodiversity Strategy as an opportunity for the state government to implement biodiversity principles that can be delivered in parallel with all other farm management practices.

Development of such a process could assist in the reduction of the loss of habitat values in intensive agricultural areas, particularly in areas considered to be more

fertile, coastal and highly populated areas as well as promoting sustainable farming practices.

3. Should government be seeking to conserve existing ecosystems or manage for change?

The QFF believes there should be enough flexibility in the system to manage for both conserving existing ecosystems and managing for any potential changes in landscape-scale biodiversity challenges of the future. We must all accept that there will be change, the science indicates that this is inevitable.

Changes in climate overtime may make some farming areas unviable, while temperature and rainfall fluctuations may make some other areas arable. The challenge for Government and Non-government NRM bodies and organisations is to deliver effective management plans that allow for this gradual change without affecting the sustainability, viability and disturbance of our natural water, land and environmental resources.

Farmers are part of the solution to securing the resilience of our ecosystems but they must do so within the confines of their businesses. The commonwealth Reef Rescue program has shown that farmers can be agents for change by implementing progressive farm management practices that aide in ecosystems support. To do this effectively the QLD Government should work with industry in a similar approach.

4. In what ways might current land use and biodiversity management practices be modified and enhanced to address the need for increasingly dynamic and adaptive management of natural systems in a changing climate?

Sustainable agriculture relies on risk assessment and change at farm-scale level. Most QFF industry bodies have established FMS or industry Best Management Practice (BMP) systems to implement sustainable farm practices. The QFF FMS Framework was established in 2005 with Queensland Government Memorandum of Understanding (MoU) to ensure consistent standards within and between farm industries.

The Queensland Government should work with industry to develop public and private investment partnerships that encourage innovation by underwriting the initial risk to adopting new farm management practices that have low emission footprints and high productivity and environmental benefits.

All levels of Government need to work with farmers and industry organisations to assist them to meet the challenges indicated in the climate change science. Government needs to encourage scientists to work hand in hand with farmers who understand the hazards of scientific uncertainty and making decisions based on risk assessments. A level of maturity and recognition of this needs to be brought into the discussion so that farmers are given the credit for understanding the future increases in climate variability, the need for low emissions farming systems and how these challenges are relevant to their type of business.

5. ***In light of inevitable species loss and ecosystem change, how might the Queensland Government prioritise the use of limited public resources and encourage private investment to protect the intrinsic and economic value of Queensland's biodiversity?***

QFF recommends that in moving forward the State support systems that recognise and encourage proactive management of significant biodiversity areas and indeed reward subsequent improvement in regional biodiversity. The State Government should invest in bringing an industry perspective as well as the catchment wide perspective approaches together to deliver an industry and environmental outcome that encourages an improvement in biodiversity by supporting voluntary approaches that deliver enduring change through collective ownership and therefore overall improvement in landscape health.

The following are the highest priority initiatives that QFF would like to see the Queensland Government engage in:

a) The first priority should be to undertake an audit of existing resource condition, collation of all existing known environmental audit material into a single information resources, with priority then focused at plugging the gaps.

b) Work with industry to identify on farm management practices that deliver a biodiversity outcome.

c) Identify potent 'buyers' for ecosystem services. Using both the carbon trading and existing water examples and possibly the 'Green Offsets' program in Queensland.

d) Building on existing initiatives. Adding to existing initiatives makes more sense such as building biodiversity offset as a possible add-ons to carbon trading e.g. work in FNQ NRM or the CFI, building on water quality and water use efficiency initiatives and consumer pricing to provide incentives e.g. SEQ Healthy Waterways.

e) Broader recognition of good practices in the market place. There is no premium for 'good practices' for food producers. Maybe we need to build it, starting with an appropriate recognition system for Best Practice (as opposed to good practice) which could build on the new 'Australian Grown' labelling scheme, and promotion of that in the marketplace.

f) QFF advocates projects that incorporate sustainable farm practices that have a business focus and provide industry with a leading role in the delivery of service and advice to farmers.

6. ***How might biodiversity outcomes of carbon sequestration projects be optimised?***

In the regional / catchment context, carbon sequestration opportunities could be identified into regional NRM plans, and in so doing establish reliable local targets. To deliver these targets at the farm scale we should focus on farm management plans (as

developed by the QFF FMS and BMP programs) and these should be used to deliver tools and advice that encourage management practices that either sequester more carbon (plant or soil) or reduce the emissions of greenhouse gases.

The success of any carbon sequestration plans by the Queensland Government will be in their ability to make an implementation process that does not detract from farm profits or production.

QFF is concerned about programs that are enforced that will tie-up viable arable farmland and farm production to these sequestration measures. The Queensland Government will need to provide funding incentives, peer-reviewed scientific research and implementation measures that do not impact on farm productivity or profitability, if these projects are to be universally accepted by the Queensland's farming industries.

7. ***What mechanisms might be employed to enhance or create markets for biodiversity, or to incentivise improved biodiversity management by private landholders?***

Providing incentives to farmers has been an efficient way to implement biodiversity initiatives in such a way as to provide a win-win situation for all stakeholders involved. Programs such as Nature Refuge and Nature Assist have previously been utilised with good outcomes for biodiversity in the past. Therefore, QFF recommends that the Queensland Government continues this strategy for NRM planning.

Regional NRM plans need a cooperative approach that allows for sustainable environmental outcomes without impacting on farmers production and opportunities for economic viability. It is unrealistic to expect that farmers continue take the burden of environmental stewardship without compensation for the loss of land-use or production values.

One effective way to compensate farmers is to develop an "ecosystem services" environmental payments program. .

QFF recommends an increased emphasis on providing incentives for uptake of sustainable agricultural practices. This requires government investment and thorough economic assessment and evaluation of the recommended practice or other means of demonstrating its business benefits.

Water Management

1. ***Are you aware of initiatives in relation to water sources in Qld which should be highlighted.*** –

    a. The issues paper mentions the water planning process but makes little comment on the importance of this planning process for rural water in Qld apart from a comment on trading. For example, analysis of the plans would give a useful assessment of the capacity of different irrigation areas to cope with climate change impacts. The differences between supplemented and unsupplemented areas would be highlighted as well as within supplemented systems the differences between river and channel based systems. Adaptation planning would need to take account of these differences.
    b. Water trading will help irrigation areas adjust to climate change but there are a number of limitations to trading that need to be recognised. Where markets exist they are relatively small and immature while in many areas they are non-existent. Also, water trading will mobilise sleeper licences which will reduce the reliability of water in areas making it difficult to manage for seasonal variability. The impact (pros and cons) of water trading needs specific assessment in its consideration as a tool for adapting to climate change.
    c. Initiatives in schemes such St George to implement capacity sharing are important in assisting irrigators to manage for seasonal variability of water supply. Investigations are proceeding, but slowly, to implement this system in the Burdekin scheme. The wider implementation of this approach which allows irrigators to manage the use of their water allocations within seasons

and from season to season is an important adaptation initiative that should be pursued.

d. The Queensland Competition Authority (QCA) pricing for SunWater schemes will include a number of recommendations that will have an influence (both positively and negatively) on the capacity of these schemes to adjust to climate change. The specific implication of pricing policies on the ability for irrigators to adaptively manage their water reliability under future climate scenarios needs further assessment.
e. The SEQ Water Supply strategy has identified a number of initiatives that will be important in the context of climate change adaptation. These include:
    i. The Queensland Water Commission (QWC) together with DERM investigate options to facilitate trading in areas
    ii. QWC to prepare a transparent framework to investigate opportunities to conjunctively manage rural and urban supplies to increase both the volume and reliability of supplies for rural use.
    iii. QWC to investigate opportunities to increase the use of recycled water for irrigation. See comments below.
    iv. QWC to investigate remaining options for surface storage for urban & rural purposes in Logan & Mary Basins. There may also be an option for increased rural water availability in the Warrill.
    v. Ongoing implementation of on farm water use efficiency program in the SEQ.

   Progress made on these initiatives has been slow but all are important to identifying options for irrigation to adapt in the SEQ region. Irrigation in areas such as the Lockyer is at risk for a range of reasons. One is the capacity for irrigated agriculture to adapt to climate change given the priority that has to be given to urban water supply now and into the future during low rainfall periods.

2. How can we achieve better integration across sectors and/or across institutions on water management

a. The test case for integration of water management across urban and rural sectors is in South East Queensland where management structures are highly urban focussed. The initiatives being investigated by the QWC and outlined in 1e. above will provide some insight into opportunities for integration.
b. Implementation of capacity share systems is the best option currently for better integration of rural and urban water management in areas where rural water supply is the dominant use.

3. Is the diversification of water supply sources the key to successful adaption and, if so, what are the key resources and what initiatives are required?

a. Irrigation areas already access water from a range of fresh water sources e.g. stored water, river flow, groundwater and overland flow.
b. As outlined below the options for access to urban based recycled water are too costly for rural use.
c. Coal seam gas water is emerging as a potential alternative water source for rural use but significant work has to be done to address the feasibility of this supply source in both a public policy and economic sense.

4. What are the barriers to increasing use of recycled water?

As outlined above the QWC is investigating opportunities to increase the use of recycled water for irrigation in SEQ including supply of recycled water to enhance declining rural production in the Lockyer and investigations to proceed on reusing treated waste water from Beaudesert & Flagstone areas for irrigation along the Logan River. Both investigations have identified that these irrigation areas cannot afford the cost of recycled water. It has also been suggested that it is difficult to progress these investigations while resource operational planning to define water entitlements for areas like the Lockyer groundwater have yet to be completed. This is a significant issue as in 2006; 245,000 ML of treated waste water was discharged from waste water treatment plants in the region with only 17,000 ML being recycled including about 400ML for rural production. By 2056 the amount of treated waste water for recycling is forecast to increase to 400,000 ML per year. Until the water resource planning process can keep up with the policy development process it is difficult to see this impasse improving. Nevertheless irrigators are always looking for ways of increasing their irrigation water reliability by finding alternative sources.

5. What information do you need about how water can be used and managed sustainably?

The conduct of the Rural Water Use Efficiency Program and the implementation of industry based best management practice programs have identified the significant information needs and resources required to improve efficient and sustainable management practices across the intensive agricultural sector in Queensland. QFF could provide further advice on this matter.

There are also a range of areas that warrant investigation regarding the need for improvement in information to support both water resource planning and irrigation scheme management to improve how water can be used and managed sustainably. In the case of water supply planning the following options need investigation:

- Monitoring of runoff under different catchment conditions (e.g. evaporation, groundwater recharge, riparian vegetation or swamps) and the upgrading of hydrology modelling to take account of the data. The article by Professor Mike Young highlights the importance of focusing on inflow rules and the role of the market in optimizing storage rather than on setting a volumetric limit on diversions. (*Droplet 12 – A sustainable cap: What it might look like? Mike Young University of Adelaide and Jim McColl CSIRO Land and Water 15/6/2008)*
- Improved data on risks to catchment health to allow better prioritization of planning effort e.g. the take of water for irrigation may not be a significant risk to catchment health in an irrigation area as say salinity and rising groundwater.
- Improved data on entitlements (e.g. conversion of authorized works to volumetric entitlements) to ensure that the impacts of climate change on all entitlements defined through the water resource planning process can be adequately addressed and conversion to tradable or at transferable water entitlements can be facilitated.

- Improvements in the monitoring and annual reporting of water resource plans to provide assessments of the performance of plans regarding environmental water security objectives and trading outcomes
- Improvements to monitoring in unsupplemented systems to assess flow conditions, contributions needed for supplemented requirements, management of caps on unsupplemented take of water during different flow conditions to allow improved advice an access to flows and trading arrangements.
- Data gathering and analysis to address connectivity between surface and groundwater use.
- Data gathering and analysis at localized scales to identify measures that will help to improve sharing of water between high and medium reliability use.

Areas for investigation regarding improvement in information for management and improvement of irrigation schemes include:

- Data gathering and analysis aimed at improving the distribution efficiency of schemes including such issues as reducing scheme transmission losses, improving water ordering, improving system monitoring and metered use.
- Implementing quarterly reporting on scheme performance using a 'levels of service' approach that provides performance indicators on long-term supply and reliability, seasonal water availability and water shortage severity.
- Implementing, as part of the water resource planning process, self-managed systems such as continuous sharing arrangements that allow irrigation users more flexibility to individually decide on their water use performance on an ongoing basis from season to season.

Primary Industries

1. ***What would be the most effective and relevant way to present information on the risks and impacts of climate change to your sector and/or region?***

Information to assist farmers to make timely decisions on the potential impacts of climate change will be essential to agriculture preparing for, and adapting to changes in climate. Substantial work by large numbers of organisations on climate change is taking place, ensuring the linkages between this work is essential. Keeping informed of the latest and most credible predictions, estimates, or actions is a difficult task for individuals given the volume or reports and commentary.

QFF believes the most effective and relevant way to present information to the primary industry sector is by investing in a communication strategy delivered by industry to ensure farmers are able to access the most relevant and credible information and that this information can be updated at a time scale relevant to their production systems. After all it is within these production systems that the day to day decisions are made.

2. ***Who would you trust and be willing to work with to assess the risks and identify opportunities for your business under changed climate conditions?***

Agriculture has considerable capacity to adapt to the climate — changes in land management practices, crop and cultivar choice and selection of animal species and technologies to increase efficiency of water use are just some adaptations already implemented to change the geographic and climatic spread of Queensland's agricultural activities. All of these activities could and will be further deployed by farmers to respond to climate change, although as the degree of climate change increases the limits of this adaptive capacity may be tested. There may be some gains in some regions emerging from low levels of climate change as a result of longer growing seasons, fewer frosts, higher rainfall (northern Australia) and CO_2 fertilisation.

The agri–business units and regions most at risk will be:

- those already stressed — economically or biophysically, as a result of land degradation, salination and loss of biodiversity;
- those at the edge of their climate tolerance; and
- those where large and long lived investments are being made — such as in dedicated irrigation systems, slow growing cultivars and processing facilities.

QFF's members, region wide have been working on developing both commodity specific and sector wide action plans to ensure that landholders have the tools to assess the risks and opportunities associated with climate change and factor that into their ordinary business. Farmers have been dealing with climate variability for many generations, including, over the last seven years, the worst drought on record, Those that have the risk management skills best able to deal with climate change will best placed in the longer term.

QFF advocates working with government agencies whose key role should be researching and providing advice on appropriate scenarios for various industries, commodities and regions, and working with industry on developing appropriate sectoral responses including supporting the development of FMS climate modules.

3. ***What type of support do you, your sector or industry need from the Queensland Government to help take action to ensure your business is able to respond (adapt) to changing climate conditions?***

QFF is focussing on production risk in response to this question but there are many climate risks that are poised to impact on the agricultural sector that include; water resource management, fire risk, and pest and disease to name a few.

Greater rainfall variability will pose challenges both for extensive and intensive livestock industries. Extensive industries may face significant variability in carrying capacity form year to year, whilst intensive industries may face greater variation in the difficulty and cost of obtaining fodder and grain supplies. Investment is required in programs that facilitate the ability of production systems to level out any increase in the variability of carrying capacity and fodder production.

An increase in the frequency and scale of weather events will pose threats to annual and perennial crops through storm, flood and hail damage. An increase in extreme temperature variations will raise the potential for severe heat or severe cold events causing widespread damage to annual production. The intensive production industries where the geographical scale of properties is not as large, systems such as netting have been used to protect crops from weather events However, an increase in intensity of these events may require a redesign of physical protection systems. Investment is required in programs to improve the security of crop production in the event of an increase in frequency and intensity of extreme weather events. Further, work needs to be done to address the increasing erosion of financial tools that farmers might have to insure against these type of events occur.

4. ***What would be the best approach to providing support services, i.e. publicly, private or industry based, joint public-industry, or some other model?***

QFF and its member groups have sought funding to progress climate change initiatives previously but so far only a few very targeted projects (dairy, cane and horticulture regional case studies only) have been resourced and there is a danger that this will result in a fragmentation of efforts to keep farmers engaged in the important work to manage the impacts of climate change on farm activities in Queensland. QFF advocates close and ongoing relationships between industry bodies and rural R & D corporations, as well as continuing investment in updating FMS programs.

5. ***What would you need to make deeper structural changes in how you undertake your business in the event existing types of agricultural production could not continue?***

Changes in farm business structures and ownership of the resource may also be driven by the effects of a changing climate. Some industries have already seen a growth in corporate and non-farmer investment in properties and production. There are also examples where the management expertise of a farm is separate from the ownership of the production resource.

If seasonal production becomes less secure, the capacity to spread risk through new and novel business structures will assist farm enterprises to manage these risks. New approaches could also be used to leverage new entrants into agriculture through the provision of management expertise. Greater agreed understanding of the tax, corporate governance and land tenure arrangements that either support or hinder this flexibility is required

However, history would suggest that the majority of farms will continue in the foreseeable future to be family owned and operated and facilitating appropriate business structure for these enterprises will be important.

The Queensland government needs to invest in programs to develop farm business structures that facilitate ability for farm businesses to manage increased production risk.

Emergency Management

QFF anticipates that other stakeholders will comment on this section in more detail. Please note that the intensive agriculture sectors are monitoring the climate change implications for emergency management and would like to be engaged in further discussions.

1. ***To what extent are adaptive and continuous improvement processes in existing emergency management systems sufficient to accommodate increasing risk and uncertainty from a changing climate?***

2. ***How do agencies and systems prepare for the possibility of simultaneous and serial emergency events in Queensland, Australia and the region as a result of climate change, including for recovery efforts following the emergency phase?***

3. ***What are the opportunities and responsibilities for the private sector, civil society and community members to take account of risk and uncertainty from a changing climate in their preparedness and response for emergencies?***

4. ***To what extent are institutional and governance arrangements for emergency management covering local, regional, and state levels sufficient to accommodate increasing risk and uncertainty from a changing climate?***

Human Health

QFF anticipates that other stakeholders will comment on this section in more detail. Please note that the intensive agriculture sectors are monitoring the climate change implications for human health and would like to be engaged in further discussions.

1. ***What more can be done to reduce preventable disease, morbidity, and morality in the vent of extreme weather event for our most vulnerable members of the community?***

2. ***How can we improve our current practices to ensure the vulnerable are better protected during heatwaves?***

3. ***What do Aboriginal and Torres Strait Islander people feel is needed to improve individual and community health and well-being in the face of climate change impacts?***

4. ***In what ways can we minimise the spread of disease in the event of climate change?***

5. ***How can we improve our health care system and health protection services to better prepare for the impacts of climate change?***

Summary

Capturing the opportunities and managing the risks will be challenging, and the farming and rural community need to be prepared as best they can to deal with the eventualities. Investments that aim to secure Queensland's food and fibre production industries, and maintain rural populations are necessary for the long term benefit of the Queensland community and economy.

The QFF and its members look forward to entering into partnerships with Government and to further prepare Queensland's agriculture sector for the challenges ahead.