For land use planning use your voice

How land use planning shapes flood risk in Saskatchewan and what residents can do about it.

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Have you noticed warmer summers, stronger thunderstorms, longer drought periods and flooding in more areas? Those are some consequences of climate change which refers to long-term shifts in temperature and weather patterns (United Nations, 2013). Natural phenomena like the water cycle are shifting. How, when, where and how much water falls or moves through that cycle no longer follow the same patterns they used to follow a few years ago, and they continue to change rapidly. These shifts affect our daily lives in every way. For example, if you ask someone who has lived in the same town for thirty years they will probably tell you that rain doesn't fall the way it used to. What once took an entire day now falls in half of the time, what used to melt slowly over weeks now rushes off the land in days and places that had great movement of water are now flooding.

Much of this damage impacts cities and agricultural land. When talking about flooding the province of Saskatchewan is facing extreme challenges. When heavy rain overwhelms a city, it has a big weight on almost every level, from homes and basements, to bridges, roads, dams, landfills, wastewater treatment plants, and hospitals. For many home owners, the clearest sign of a changing climate is an insurance policy. Residents now rely on bigger rain gutters, rain barrels and water-loving trees planted near runoff points just to keep their basement dry. Faced with rising risk and shrinking insurance options, many residents have started adapting on their own. The worry isn't only about property damage, it's about a way of life feeling increasingly out of one's control. The sense of being caught off guard, again and again, by water where it didn't use to be, is gradually shaping the tone in flood-prone communities.

"We can't get flood insurance on our house anymore."

What happened in Yorkton between 2010 and 2016 gave a clear example of this pattern. In just six years the city was hit by three major flood events, each one arriving with its own unanticipated cause and exposing a different gap in how the city had been built and managed. The first flood, in 2010, overwhelmed a stormwater drainage system that had simply never been designed to handle that much water (Salman & Hurlbert, 2022).

Four years later, the 2014 flood revealed a second failure. Every year the city faced more rain than before that had left the ground saturated, so rainwater that once would have soaked into the soil instead poured into the sanitary sewer system.

Making things even worse, many homeowners had connected their basement pumps directly to the sanitary

system instead of to the separate stormwater system. These were small, individually reasonable decisions that, multiplied across the city, pushed the sewer network far past its capacity and sent water backing up into basements. The consequences faced were the result of accumulated decisions in infrastructure, zoning, and household decisions that had never been coordinated with flood risk in mind. Longtime Yorkton residents stated that rainfall has intensified dramatically since the 1990s, what used to be a notably heavy storm now happens routinely, and because so many local basins are closed systems, that extra water has no natural outlet (BWAG Infrastructure Focus Group, 2023).

It took until 2017 and three floods for the city to commission a proper LiDAR study of its own drainage patterns. That study confirmed what was already suspected: flood-prone neighborhoods and the layout of old railway lines, planning decisions made long ago that reflected in the city's structure, were actively worsening the flooding (Salman & Hurlbert, 2022). The mitigation plan cost almost 40 million CAD, and even years later, much of the infrastructure still hadn't been built.

Much of Yorkton West's drainage infrastructure was built in the 1960s and 1970s.

The infrastructure in the city was built long before anyone planned for today's heavy rainfall, and an engineering assessment found that most of the neighborhood's manholes were already failing to handle even routine, once-every-five-years storms, let alone anything larger (Salman & Hurlbert, 2022).

The working infrastructure was built for a climate that no longer exists.

Planners and infrastructure experts have pointed out a pattern that repeats across the province: that is that many of today's flood-risk urban areas sit on what used to be wetlands, natural basins that once absorbed and slowed heavy rain before it ever reached a street or basement (BWAG Infrastructure Focus Group, 2023). Building and paving over the natural buffer capacity removed the landscape's own way of managing precipitation.

Losing that natural buffer capacity is, in many ways the clearest illustration of what land use planning actually governs. It's not just about where buildings go, but whether the environment can maintain its natural ability to handle impacts, absorbing and slowing water before it turns into a crisis.

Background

Land use planning is, at its core, the deliberate decision-making process that governs how a given piece of land is used, developed, or protected. In practice, it's the result of active choices about drainage, development, and conservation that spread out in ways that aren't always visible at the time they're made. That distinction matters in Saskatchewan, where farmers don't drain wetlands because they want to get rid of water, they do it to gain more workable cropland, and the economics of that trade-off have reshaped the province's landscape for decades (Kishchuk, 2023).

This principle also applies upstream and downstream of any city. A decision made for a single section of farmland rarely stays contained to that section. Water rerouted off one field has to go somewhere, and where it ends up, for example a nearby farm, a ditch, and eventually a city's stormwater system, is rarely part of the original plan. Land use planning, then isn't just about zoning maps and building permits within a city's limits. It's also about the combined, frequently unaligned choices made in both farming and city development that reshape how water moves, or doesn't move, across an entire watershed, long before that water ever reaches a street or a household.

Land use planning was only altered after the consequences of neglecting it had been experienced.

As stated above, 2017 marked a turning point for land use planning at two very different scales, and both are relevant here. At the provincial level, after several consecutive years of excess moisture had pushed drainage disputes and flood damage to the eye of the public, the Water Security Agency presented its Agricultural Water Management Strategy, a new regulatory framework meant to bring coordination to the drainage approval process. (Water Security Agency, 2017).

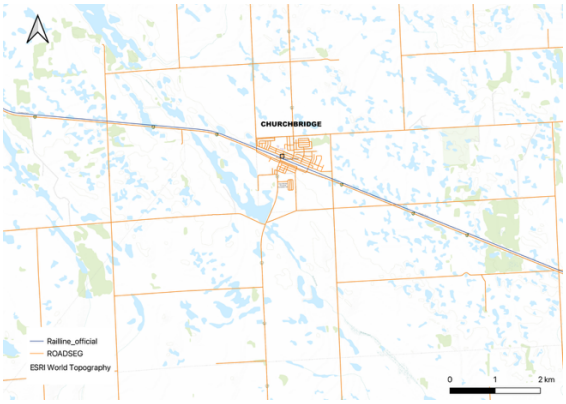
Revisiting the Yorkton case, which is at the municipal level, the city was compelled to confront its own reality. After the floods, in addition to the new design standards that the city should adopt recommended by the engineers, minor drainage systems were required to withstand five-year storm events and major systems were required to handle even rarer, one-in-a-hundred-year events (Salman & Hurlbert, 2022). It was a meaningful shift, but one that applied only to new construction going forward, leaving the older, already built parts of the city working with the same undersized infrastructure that had failed in the first place. In both cases, the pattern is the same land use planning changed only once the cost of not planning had already been paid.

Regional residents of the Assiniboine Watershed many times have pointed to infrastructure that had never been brought under any planning strategy at all which are railways and highways. Most of the region is located on flat, low-relief prairie, terrain that already gives water few natural paths to drain quickly. Railway tracks and road elevations are built above the surface to keep the road base stable and dry, but on land with these characteristics, a raised barrier running for miles becomes a wall as much as a road. Water moving across the landscape reaches this barrier and has nowhere to go, so instead of spreading out and receding, it pools against the structure and rises, held in place until it finds the few culverts built through it, or until it is blocked.

Residents described culverts along CP (Canadian Pacific) rail lines and provincial highways as too small, incorrectly installed, or years past a planned replacement, even where engineering studies confirmed the fix was straightforward and would not increase flow downstream. Essentially, these structures function like unintended dams, and where a culvert is undersized or blocked, the water backs up over farmland and hillsides, in some cases for years, rather than being an incidental side effect. Residents highlighted not just the damage, but also the disparity in how responses were handled.

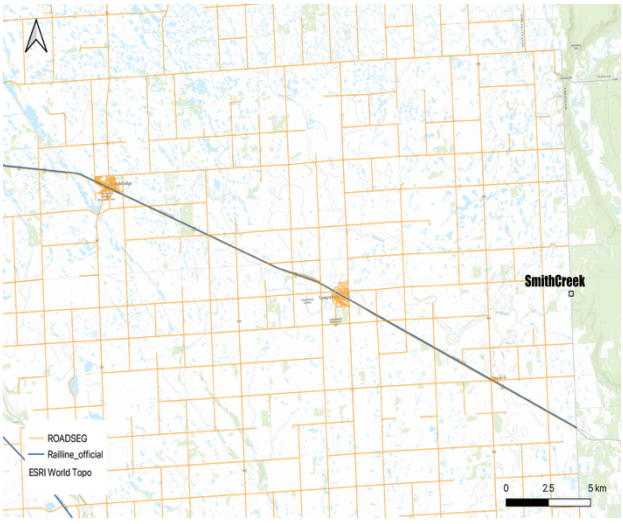
RAILWAY AND HIGHWAY INFRASTRUCTURE

Churchbridge



Note. Map created by Natalia Guerrero using ArcGIS/QGIS-LTR, with data from ROADSEG (Government of Saskatchewan, 2026) and RAILLINE_OFFICIAL (Government of Saskatchewan, 2026). Base map: Esri World Topographic Map.

Smithcreek



Note. Map created by Natalia Guerrero using ArcGIS/QGIS-LTR, with data from ROADSEG (Government of Saskatchewan, 2026) and RAILLINE_OFFICIAL (Government of Saskatchewan, 2026). Base map: Esri World Topographic Map.

Climate pressure

Saskatchewan's water security challenges rarely arrive one at a time. Drought and flood are often framed as opposites, but on the prairies they behave more like two faces of the same instability and both are becoming harder to predict, harder to prepare for, and more expensive to recover from.

Even though droughts cause a lot of damage that lasts longer and it covers far larger areas, that makes both the immediate impact and the long-term recovery more difficult to manage (BWAG Objective 2 Report, 2024). Because farming is so important to Saskatchewan's economy, the effects spread widealy. Lower water quality, loss of wetlands, soil wearing away, and damaged natural habitats usually happen after long dry periods.

These problems add more preassure on farmes, who are already dealing with the direct impact of poor or smaller harvests.

On the other hand, excess moisture has proven to be just as costly. Between 2005 and 2014, Saskatchewan received the highest per-capita payout in the country from the federal Disaster Financial Assistance Arrangements program, and the majority of those payments were flood-related (Wittrock et al., 2018, as cited in BWAG Objective 2 Report, 2024). The 2011 flood alone cost governments at every level close to one billion Canadian dollras in flood-fighting efforts and victim compensation, and the 2014 flood surpassed that figure again, with losses in crops, homes and community infrastructure (BWAG Objective 2 Report, 2024).

The Quill Lakes flooding between 2012 and 2018 provides a detailed view of the impact that prolonged excess water has on a region. In this case, roughly $74 million CAD were lost in crop and livestock production, more than $100 million CAD in destroyed farmland and buildings, and $79 million CAD were spent repairing highways and a rail line, including more than $17 million CAD in confirmed net farm income losses (Warren, 2018, as cited in BWAG Objective 2 Report, 2024).

What makes the province's situation especially difficult to plan is not drought or flood alone, but the speed at which conditions shift between the two. Rapid transitions from drought to flood and back again place unusual stress on ecosystems and elevate the risk of pollution, since dry, degraded land is often poorly equipped to absorb the sudden heavy rainfall that follows it. These sudden changes also cause progressive risks to infrastructure, where systems built to handle one kind of extreme are suddenly face the opposite situation.

Water quality problems tend to intensify after both drought and flood events. Elevated cyanotoxin levels and late-

season cyanobacterial blooms have become more common, and the burden falls hardest on drinking water systems in remote and Indigenous communities, though non-Indigenous communities aren't immune (BWAG Objective 2 Report, 2024).

Underlying all of this is a governance and infrastructure gap that has struggled to keep pace with the changing water cycles of the province. Institutional efforts to respond to flood and drought events have sometimes been challenged by limited emergency resources and poor coordination among agencies, while policy tensions remain unsolved around zoning compliance, insurance, and agricultural drainage. Much of the province's infrastructure adds to the problem because of its deteriorated condition. As mentioned before, many of the drainage systems currently used in the province, such as in Yorkton's case, were built decades ago, long before anyone designed them for today's rainfall intensities (Salman, 2021). Wastewater treatment plants across the province may similarly need upgrades to handle the more frequent and more intense rainfall events that are projected for the prairies in the coming decades (Bergen, 2022, as cited in BWAG Objective 2 Report, 2024).

The unequal impact of flooding

Flooding in the province is often described as a shared provincial burden, but the information gathered in recent years about the negative impacts caused by these incidents tells a more uneven story. The same flood event can mean a delayed harvest for one household and a big threat to safety, income, or cultural practice for another, depending on where someone lives, how much money they earn, and how long their community has been excluded from the system that govern water in the first place.

Geography is one of the clearest gaps. Emergency management representatives pointed out that rural and First Nations communities face a structural disadvantage when disaster strikes, simply because their settlements tend to be remote and harder to reach, meaning that redirecting emergency personnel and resources toward them during a flood is logistically far more difficult than responding to a big city or town (BWAG Infrastructure Focus Group, 2023). These communities may rely on a single access road or lack well-paved routes altogether, so a flood doesn't just damage property, it can completely isolate a community when support is most essential.

That disparity deepens when property rights and economic dependence enter

the picture. Some First Nations who lease their land to farmers lose rental income entirely when that land floods, generating a loss that non-Indigenous landowners without the same lease arrangements simply don't experience in the same way (BWAG Objective Two Summary Report, 2023). Flooding has been described as disrupting basic mobility for entire communities, limiting people's ability to reach work or essential services during and after an event.

Beyond the immediate financial hit there is a longer-term pattern in which combined pressures such as climate change, land use change, industrial development, and wetland drainage are progressively undermining First Nations' rights to exercise treaty-protected practices such as hunting, fishing, and gathering.

Within the agricultural sector itself, vulnerability is far from evenly distributed. Young farmers and small family-run operations face greater risks compared to larger, corporatized farms, mainly because farm consolidation and increasing debt means smaller producers have less money saved to handle a bad flood year. Gender adds another layer to that inequality. Women who work in agriculture are frequently excluded from the decision-making spaces and industry conversations that shape how farms respond to flood risk, despite carrying a significant responsibility for farm management, while queer and otherwise marginalized producers reported facing additional barriers simply navigating a conventional agricultural space that wasn't built with them in mind (Ezra & Fletcher, 2025).

Even within a single household, vulnerability isn't always shared equally between partners. There is a common divide in which one partner worked in air-conditioned, technologically advanced equipment while the other managed a non-air-conditioned farmhouse. This illustrates how climate exposure can differ sharply along gendered lines even inside the same family operation (Beltran et al., 2025).

Underneath all of these disparities sits a longer historical pattern. Indigenous communities' unequal exposure to water-related risk isn't simply a function of geography or economics, it's also rooted in a water governance system that has historically excluded Indigenous knowledge, culture and authority altogether, a legacy of colonization that continues to limit equitable access to safe water (Hurlbert, 2024).

Part of why flooding lands so unevenly on Indigenous communities traces back to governance differences.

Reserve lands fall under federal jurisdiction while the rest of the province's water is governed provincially, a separation that goes back to the 1930s, when authority over water and natural resources passed from Ottawa to the

provinces, a decision made without any Indigenous nation representation (Hurlbert, 2024). This matters because treaties like Treaty 4 never granted Indigenous water rights in the first place, they confirmed rights that already existed under Indigenous law, establishing a nation-to-nation relationship rather than a subordinate one. In practice, though, provincial and federal decision-making has often ignored that relationship, relying only on a small duty to "consult" instead of the full right to give informed permission that Indigenous Nations are increasingly asking for under international law.

The consequences aren't just historical, they show up in how slowly help arrives during an actual flood. Because First Nations communities typically depend on federal infrastructure funding rather than provincial programs available to municipalities, they face significantly longer approval timelines. Records indicate that one federal flood mitigation project took over two years to gain approval.

This shows the mismatch when it comes to governance. Provincial management is built around permits and allocation, treating water and land as a resource to be managed, while Indigenous governance is rooted in relationship and responsibility. Cumulative land-use decisions made without First Nations' consent, like drainage, industrial development and urbanization, have steadily eroded the nations' ability to exercise treaty-protected practices, which shows the ongoing breach of treaty rather than a series of isolated impacts.

What is working?

The good news is that flood resilience doesn't have to start from scratch. Some parts of it are already working across Saskatchewan.

The economics back this up. A pilot study in the Redberry Lake region compared three flood adaptation strategies, an engineered retention and drainage system, enhancing a natural creek channel, and simply steering future development away from flood-prone land through regional planning. Of the three methods, redirecting growth through planning consistently produced the lowest expected damage costs, while the engineered options were far more sensitive to construction costs and future storm frequency, in one case never proving worthwhile at all (Redberry Lake Biosphere Reserve Association & Prairie Wild Consulting Co., 2013). Planning ahead, it turns out, is often cheaper than waiting for the impact and its consequences.

There are four important parts to the overall picture: environmental, governance livelihood, and Indigenous knowledge.

On the land itself, some of the most effective adaptations are also the simplest. Building up organic matter in the soil makes the soil act like a sponge, it

helps the soil to hold more water during a flood and retain more water during a drought, offering an option to manage both, flooding and drought, at once.

That reasoning applies equally to flood-prone, unprofitable cropland. Transforming it into forage or cover crops allows it to absorb heavy rainfall rather than channeling it downstream, while restored wetlands and streamside buffers serve as natural infrastructure that historically slowed water flow before it ever reached a city (Hillis et al., 2026). But none of these fixes stay contained to one farm. Whether that natural buffer capacity gets built or paved over is ultimately a governance question, which is where the second piece comes in: governance.

That's the gap Saskatchewan has struggled with most. The battle between reactive and proactive programs in water management. Historically, the province has funded reactive actions more generously than proactive ones. Where this imbalance is beginning to change, it often follows a familiar pattern, watershed advisory committees that treat residents as equal interested parties rather than an afterthought supported by clear communication instead of complex and technical terminology. Take the city of Yorkton for example, councillors took resident concerns seriously and raised them with engineers, then incorporated eleven resident-identified flood zones directly into the city's official mitigation plan (Salman & Hurlbert, 2022). That kind of collaboration should be the standard.

Indigenous water governance offers a different approach, not just an extra one, alongside environmental and government changes. While provincial planning sees water as a resource to divide, Indigenous knowledge holders see water and land as a living relationship that come with long-watched natural signs like seasonal water flow, wetland changes, and soil memory to warn of floods, even before engineering studies existed (Hurlbert et al., 2025). The example of Redberry Lake planning showed that including watershed groups, farmers and First Nations as partners from the beginning works better than consulting them after plans are made.

And that standard depends on the fourth and final part. Residents who actually understand what's at stake. The clearest evidence that this works comes from the actions taken by the population after major impacts in their communities. People who now watch forecasts and question new development with a sharper eye than before (Salman & Hurlbert, 2022). That is what a good adaptation ultimately looks like, a community informed enough to keep asking the right questions even when the disaster is long gone.

What to do?

Part of the problem is structural. In Yorkton's case, there was no formal procedure requiring the city to inform

residents of its plans, most people learned about drainage decisions informally, through local news or word of mouth, if they learned about them at all (Salman, 2021). That gap is exactly where the people's voice steps in as the key resource.

First, it is important to identify the risks and this gets done with knowing where to look. Municipal council meeting minutes and video recordings are public records in most Saskatchewan cities. In Yorkton specifically, the city now runs a dedicated engagement platform "Shape Your City", where residents can track construction and major city projects as they're proposed, not after they're approved. Council meetings, including drainage and infrastructure discussions, are posted on a public calendar, and residents can request to speak directly before Council rather than only submitting written comments (City of Yorkton, 2026). None of this requires special access, it requires knowing the tool exists.

Also asking the right questions is a very big step into the process of taking action, for example questions like:

- "Has an engineering or LiDAR study been done for my neighbourhood, and if so, what did it recommend?"
- "Is the local drainage system built to withstand a five-year storm or more?"
- "Is there a watershed advisory committee for my area, and does it actually include residents, or only technical staff?"
- "Has this project consulted the First Nations whose treaty rights or land use it may affect, and how?"

Are worth asking. Staying informed isn't only about municipal drainage plans, it also means following whether major provincial or industry projects have engaged Indigenous knowledge holders before decisions are made, not after (Hurlbert et al., 2025).

Then act on what you find it does make a difference. When the flooding in Yorkton happened residents who called City Hall during flood helped officials pinpoint exactly where sewer backups were happening, information the city later took into account for future infrastructure decisions (Salman, 2021).

Councillors, for their part, have shown they will raise residents concerns directly with engineers and city departments when the public actively voice those issues (Salman & Hurlbert, 2022). None of these actions requires technical expertise. They just require intention and willingness to make them.

Conclusion

The flood risk in Saskatchewan didn't just happen, it was built over decades through countless decisions, drainage projects and permits. Fortunately, it can be

reshaped just as intentionally through thoughtful land use that respects water's natural flow, proactive governance that listens before disaster hits, and engaged residents who act before rather than waiting for the catastrophe to happen. Yorkton's case study is about a community that learned that silence is often more costly than participation. The next flood in Saskatchewan isn't just a question of where and when, is also about how much damage will be reduced and this depends largely on whether people use their voices before disaster happens.

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