**Summary Statistics of Survey Data Compared with Available Data from Canada Agriculture Census**

1. **Introduction**

This section discusses the summary statistics of variables in the producer land preferences survey (hereafter called Prairie survey) in the three provinces in Western Canada. First, we discuss the demographic variables and compare their summaries with the same available demographic variables in the Canadian Agricultural Census Survey (hereafter called census survey) for the same regions; this will provide a motivation to weight variables that will be included in the model estimation stage of this project so that we can make valid inferences outside our survey group to the entire Prairie region of Canada. For the census survey we focused on farms with one operator; also; apart from the education variable, which was in the 2011 census survey, all the other variables were taken from the 2016 census survey. Second, discuss land tenure, land purchase decisions, precision agricultural technology use and crop yield information. Third, we discuss the summary statistics of wetland variables in the survey. We conclude by stressing on the comparisons between the summary statistics between the Prairie and census survey.

* 1. **Summary Statistics Demographic Variables**

Consistently, proportionally more respondents in the Prairie survey are males compared to respondents in the census survey. For instance, at least 94% of the respondents in the Prairie survey for each of the 3 provinces are males compared to at least 44% for respondents in the census survey for each of the 3 provinces. However, the respondents in the Prairie survey have similar age structure as the respondents in the census survey for each of the provinces. More people (at least 52%) are over 54 years in both surveys; the percentage for Saskatchewan in the prairie survey is highest at 71%. Apart from Saskatchewan in the prairie survey with 25% of the respondents between 35 and 54 years, the other provinces in the survey and the census survey (including Saskatchewan) have about 34% of respondents between 34 to 54 years. Again, fewer people in both surveys (at least 5.6%: Alberta, 11%: Manitoba and 1.7%: Saskatchewan for the prairie survey, and about 10% for the census survey for all the provinces) are under 35 years. Moreover, proportionally fewer people in the census survey for the 3 provinces have university degree compared to at least 23% for the 3 provinces in the Prairie survey. The results above are reported in Table 1a.

Also, proportionally more people (at least 95%) in the census survey for the three provinces say their kids are likely to take over from their them compared to the respondents in the Prairie survey which is at most 73% for Manitoba (Saskatchewan: 53% and Alberta:67%). Proportionally more of the respondents in the census survey (Alberta:52%, Manitoba:54% and Saskatchewan:54%) operate sole proprietorship farm business compared to the Prairie survey where most of the respondents operate a family corporation (Alberta:47%, Manitoba:61% and Saskatchewan:46%). The least practiced form of farming business for both census is non-family corporation. Moreover, on average, farms in the Prairie survey have been operating for at least 61 years, and the average proportion of income from farming is 83% for all the provinces. The summary statistics above are reported in Table 1b.

* 1. **Summary Statistics of Land Use Variables**

In terms of the proportion of respondents who have converted bush, wetland and native grassland, the results show that more people in Manitoba and Saskatchewan (both 31%) have converted bush land than in Alberta (20%); more people have converted wetlands in Saskatchewan (25%) followed by Manitoba (17%) and then Alberta (12%); and more people have converted native grassland in Manitoba (17%) followed by Saskatchewan (13%) and then Alberta (9%). Also, proportionally more respondents in the Prairie survey use more precision agriculture tools than in the census survey. For example, at least 88% of respondents in the Prairie survey used auto guidance equipment compared to at most 19% of the respondents in the census survey; proportionally more people in the Prairie survey (Manitoba: 49%, Alberta: 31% and Saskatchewan:28%) used GPS compared to at most 24% the respondents in the census survey for the 3 provinces; proportionally more people (at least 66%) in Prairie survey used a soil test technology compared to at most 5% for the respondents in the census survey for the 3 provinces.

Regarding the proportion of respondents in the Prairie survey who plan on making land purchase decisions in the next 5 years, more respondents in Manitoba (45%) say they will rent and buy land followed by Alberta (41%) and Saskatchewan (38%); more respondents in Saskatchewan (38%) say they will neither rent or buy land followed by Alberta (29%) and Manitoba (26%); more respondents in Alberta (15%) say they would rent more followed by Saskatchewan (7.9%) and Manitoba (6.9%); more respondents in Manitoba (22%) say they will buy land followed by Saskatchewan (16%) and Alberta (15%).

With respect to the proportion of respondents in the Prairie survey land use decisions in 2019, more people in Saskatchewan practiced zero tillage and continuous cropping followed by Alberta and Manitoba; more people in Alberta plowed green crop, rotational grazing and infield winter grazing followed by Manitoba (for plow green crops and rotational grazing) and Saskatchewan (infield winter grazing); more people planted winter crops and shelter belts in Manitoba followed by Alberta and Saskatchewan.

We discuss the proportion of respondents in the Prairie survey who owns or rent land and crop yield: more people in Saskatchewan (70%) owns crop land followed by Manitoba (69%) and Alberta (45%), but more the same proportion of respondents in the provinces rent land (28%). The distribution of acre owned, and acres rented is similar for respondents in the census survey; in particular, more people in Manitoba (65%) owned cropland followed by Saskatchewan (62%) and Alberta (58%). In terms of acres owned, on average, more crop land is owned in Saskatchewan (3,386 acres) followed by Alberta (3,331 acres) and Manitoba (2,674 acres); more hay land (133 acres) is owned on Alberta followed by Saskatchewan (122 acres) and Manitoba (67 acres); more acreage of pastureland is owned in Saskatchewan (480 acres) followed by Alberta (430 acres) and Manitoba (79 acres). Canola and spring wheat (in terms of proportion of land under cultivation in that order) are the most grown crops in the Prairie survey and census survey provinces. In Alberta (in the Prairie survey) Barley, Oats, Peas and Lentil are the most grown crops after Spring wheat in that order in terms of proportion of land acreage, while Corn, Peas, Oats and Lentils are the most grown crops after Spring wheat in the census survey; Soybeans, Oats, Barley and Corn are the most grown crops after Spring wheat in Manitoba (Prairie survey) in that order whiles Barley, Oats, Corn and Peas are the most grown crops after Spring wheat in that order in Manitoba (census survey); for Saskatchewan (Prairie survey) Barley, Lentil, Oats, Peas and Oats are the most grown crops after Canola in that order whiles Lentil, Peas, Corn, Oats and Barley are the most grown crops in Saskatchewan (census survey) after Spring wheat in that order. The results above are reported in Table 2.

* 1. **Summary Statistics of Wetland Variables**

In this section, we discuss the summary statistics of data from the Prairie survey. Proportionally, Manitoba has more permanent wetlands (21) compared to Saskatchewan (15) and Alberta (12). However, proportionally, Saskatchewan has more seasonal wetlands (23) than Alberta (17) and Manitoba (17). In the scenario, what will you do when there is no penalty with wetland drainage?: on the average about 42% of the wetlands will be drained in all the 3 provinces; more wetlands in Saskatchewan (10) will be drained followed by Alberta (7) and Manitoba (6); more acres of wetlands will be drained, on average, in Saskatchewan (68 acres) followed by Manitoba (44 acres) and Alberta (39 acres); and drainage cost per acre of wetlands will be higher in Alberta ($611/acre) followed by Manitoba ($581/acre) and Saskatchewan ($543/acre). Also, given the scenario that wetland conservation is mandatory with a sustainable agricultural certification program: about 41% of the respondents, on average, in the 3 provinces would consider conserving wetlands. Proportionally, more respondents in Manitoba (23%) followed by Saskatchewan (18%) and Alberta (16%) have an environmental farm plan; but more respondents in Alberta (66%) have participated in government best management program, followed by Manitoba (59%) and Saskatchewan (58%). Again, regarding ownership of drainage equipment, more respondents in Manitoba (59%) own drainage equipment, followed by Alberta (39%) and Saskatchewan (35%); similarly, more respondents in Manitoba (14%), followed by Alberta (11%) and Saskatchewan (7.3%) rent drainage equipment. The summary statistics above are reported in Table 3a.

Proportionally more respondents in Saskatchewan report that they have experienced 20%, 40% and 60% probability of delayed seeding, followed by respondents in Alberta and then respondents in Manitoba; but more people in Alberta report experiencing 80% probability of delayed seeding followed by Manitoba and then Saskatchewan. Again, more respondents in Manitoba (5.9%) report that they have experienced 100% probability of delayed seeding and do not farm seasonal wetlands than respondents in the other provinces. Proportionally, more respondents in Saskatchewan followed by Alberta and Manitoba say the quality of drained wetlands are 25% and 10% above the average quality of surrounding cropland. More respondents in Manitoba believe drained wetlands quality are 25% below the average surrounding land quality followed by Alberta and Saskatchewan; but fewer respondents in Manitoba think drained wetlands are 10% below the average surrounding land quality compared to Saskatchewan and Alberta (both at 12%). Again, proportionally more respondents in Alberta and Manitoba (both at 18%) think the land quality of drained wetlands are above average the quality of surrounding lands compared to Saskatchewan (16%). The summary statistics are reported in Table 3b.

Proportionally fewer respondents in Manitoba (7.8%) compared to Saskatchewan (2.8%) and Alberta (2.3%) believe increased efficiency of operations is an important factor that could motivate them to drain wetlands in the absence of penalty; similarly, about 34% of respondents in Manitoba, Alberta (25%) and Saskatchewan (19%) think the factor is extremely important and could motivate them to drain wetlands in the absence of penalty, which is also true (in terms of proportion of respondents) for land quality, delayed or prevented planting and wildlife habitat. Proportionally, more respondents in Manitoba followed by Saskatchewan and the Alberta think drainage cost and weed control are not important in influencing them to drain wetlands in the absence of wetlands; on the contrary; proportionally fewer respondents in Manitoba followed by Saskatchewan and Alberta believe the factors are extremely important and could motivate them to drain wetlands in the absence of penalty. Proportionally more people in Alberta, followed by Saskatchewan and Manitoba think the factors effects on nearby flooding and nearby land access are not important in influencing them to drain wetlands, but proportionally more respondents in Manitoba followed by Alberta (for effect on nearby flooding) and Saskatchewan (for the effect of nearby land access) believe the factors are extremely important to them in wetland drainage without penalty. The results are reported in Tables 3c and 3d.

In terms of the proportion of respondents’ belief on the importance of wetland ecosystem services (ESS), more respondents in Manitoba think water quality, erosion control and wildlife habitat are important ESS followed by Saskatchewan (for water quality and wildlife quality) and Alberta (for erosion control). However, more respondents in Alberta followed by Saskatchewan and then Manitoba think flood control is an important ESS. The results are reported in Table 3e. Proportionally more people in Saskatchewan followed by Manitoba and Alberta think the number of wetlands in their local area have decreased a lot, the reverse is true for those who think it has increased a lot; also, proportionally more respondents in Alberta followed by Manitoba and then Saskatchewan think the number of wetlands has remained the same. The same observation above is true for water quality (Table 2f). Again, for water quality ESS, proportionally more people in Saskatchewan followed by Manitoba and Alberta think the quality have decreased a lot in their local areas; but the reverse is true for the respondents who think water quality has increased a lot (Table 3f).

* 1. **Conclusion**

The distribution of respondents in the Prairie survey and the census survey is different in some key demographic variables (sex, education, and children succession plans). For instance, proportionally more of the respondents in the Prairie survey are males and have university degrees compared to respondents in the 2016 Canada Agricultural Census survey; also, significantly more people (proportionally) in the census survey are likely to transfer farm ownership to their kids compared to the respondents in the Prairie survey; again, most of the respondents in the census survey operate sole proprietorship form of business against family corporation in the Prairie survey.

However, the two surveys are similar in age structure, crop land owned and rented, and major crops grown. For example, more respondents in both surveys are over 54 years; Again, Canola and Spring wheat are the two dominant crops in that order in all the provinces (in both surveys). Also, the proportion of respondents who owned and rented crop lands are not very different in the two surveys.