# Information Audit of Socio-Economic Activities in the Gwydir River Catchment

## Report

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Prepared for

**Department of Environment and Climate Change (NSW)**

Prepared by

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## Abbreviations

| | |
|---|---|
| A | Area (as in LGA) |
| ABARE | Bureau of Agricultural and Resource Economics |
| ABS | Australian Bureau of Statistics |
| AGWF | Australian Government Water Fund |
| CEEWPR | Centre for Ecological Economics and Water Policy Research UNE |
| Ctch | Catchment |
| DECC | NSW Department of Environment and Climate Change |
| DLWC | Department of Land and Water Conservation (now DNR) |
| DNR | NSW Department of Natural Resources |
| DPI | NSW Department of Primary Industries |
| DWSP | Draft Water Sharing Plan |
| EPA | NSW Environment Protection Authority |
| GL | Gigalitre or 1,000 ML |
| iCAM | Integrated Catchment Assessment and Management, ANU |
| LGA | Local Government Area |
| Locns | Locations |
| ML | Megalitre or million litres |
| NEC | Not Elsewhere Classified |
| Psns | Persons |
| PS | Producers Surplus |
| SEIFA | Socio-Economic Indexes for Areas |
| SD | Statistical Division |
| UNE | University of New England |
| VA | Value Added |


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Naturally responsibility for all errors and omissions rest with the reports author.

# EXECUTIVE SUMMARY

This information audit of socio-economic activities in the Gwydir River catchment reveals:

## Part A: Industry Profiles and Trends

### Irrigated and Non-Irrigated Agriculture

- A community with a reliance on irrigated agriculture production – 20% of the regional economy's gross direct and indirect value of production is sourced from cotton production and ginning (Powell and Chalmers 1995).
- Agriculture, forestry, fishing and hunting directly employs one in three persons in the Gwydir community (ABS data in CEEWPR 2000).
- Cropping area (hectares) is dominated by wheat for grain then cotton, barley and sorghum. Cotton is the single most valuable agricultural crop (ABS data).
- Sheep and cattle grazing dominate livestock industries. Enterprises have switched from shorn wool to sheep meat and cattle production since the early 1990s (ABS data).
- Farm financial performance for NSW North West Slopes and Plains properties mirror the effect of drought. However, only in one year (2003) between 2000 and 2006 did average farm cash income become negative. The average farm enterprise in 2006 had liquid assets (eg bank deposits) of $81,000, total family income of $65,000 (including $11,500 in off farm wages) and a 3% return on capital excluding capital appreciation (ABARE data).
- General equilibrium modelling reveals that drought and additional allocation of water to the environment has reduced and will continue to reduce the area allocated to irrigation and increase the area allocated to dryland wheat, barley and sorghum production (Productivity Commission/Peterson *et al* 2004 and the Centre for International Economics 2004).
- The area allocated to irrigation peaked in 1998/99 and again in 2001/02 at 90,000 ha. The forecast for 2006/07 is for an irrigation area of 36,000 ha. Approximately 90% of the value of irrigated production in the Gwydir River catchment is irrigated cotton. Vegetable production is also significant (ABS data).
- An average cotton crop in the Gwydir River catchment requires 300,000 ML of irrigation water. 2005/06 was the last average crop in the valley. There are 663 irrigation licences and 92 enterprises irrigating crops in the Gwydir River catchment, 65 enterprises are thought to be irrigating cotton (Hope and Bennett 2003).
- There has been a major trend toward intensification of agricultural production systems in the Gwydir since the mid 1980s and ongoing water reform may reverse this process (Powell and Chalmers 1995).
- Studies reviewed on the impact on irrigation of additional water allocation to the environment ranged from $100/ML for 7 gigalitres returned to the environment through water sharing plans (ACIL 2002) to $2,732/ML for 9 gigalitres returned through RiverBank and similar initiatives in 2006 (BDA Group 2006). Regional multipliers (ratio of direct value added to regional value added) were variously estimated at between 1.75 (ACIL 2002) and 3 (Wolfenden *et al* 2001).

- A number of tools for assessing the impact of returning water to the environment were reviewed as part of the information audit. The most appropriate for assessing the responses of economic activities to different water availability under different management scenarios would appear to be the iCAM Decision Support System (Letcher and Aluwihare 2004). Some data calibration would be required with irrigators to make this model current (Rebecca Letcher pers comm.).

### Other Primary Industries

- Forestry in the Gwydir is native timber dependent i.e. hardwood including ironbark and softwood including cypress pine. The industry is not impacted to any extent by drought and additional water to the Gwydir Wetlands will not affect forestry in the region.
- Gwydir based mining is focussed on quarrying, gem stones and tin mining. The industry may have experienced some limits on processing capacity associated with water shortages during drought. Higher security licenses in mining, ensuring water supply, may have limited this impact.

### Processing and Manufacturing

- Agricultural service and processing industries include agricultural merchandising, professional services, regional processing operations and cotton ginning. There are nine cotton gins in the valley. It is likely that these gins service growers from both the Gwydir and other river valleys (Namoi and Barwon). Agricultural services and processing industries are directly dependent on agricultural production and will be impacted by both drought and additional water to the Gwydir Wetlands.
- Manufacturing in the Gwydir River valley has a local fabrication focus (eg sheet metal and engineering works). The sector is less impacted than agricultural services/processing by drought and additional water to the Gwydir Wetlands. It draws revenues from sectors other than agriculture and is unlikely to require river flows as an input into production.

### Services

- Construction recorded healthy growth during 2005/06 compared to 1997/98. This sector is dependent on general economic conditions rather than drought or environmental allocations.
- Services in the Gwydir River catchment likely to be affected by drought and/or additional allocations to the Gwydir Wetlands are transport services especially long distance road freight, rail transport, services to road/rail transport and grain storage. Wholesaling activities also affected will include farm produce and supplies, farm and construction machinery, petroleum, chemicals, farm machinery and motor vehicle parts wholesalers. Retail trade draws from all parts of the Gwydir economy and is less dependent on agriculture than other sectors such as transport and wholesaling.
- Tourism and recreation industries would have suffered under drought conditions. People are less inclined to take holidays in the inland during a drought and residents are more inclined to visit coastal areas for a break. Recreation and tourism would be a positive beneficiary of additional water allocation to the Wetlands. Positive outcomes would be possible for river based fishing, bird watching and camping with additional river flows.

- Government industries include local government services, education, health and policing. Utilities include electricity supply, water supply, sewerage and drainage. Government administration, education, health and community services account for 52% of service sector employment in the Gwydir River catchment (ABS data). These activities are independent of drought and environmental allocation of water. Water supply may be affected during prolonged drought events.

## Part B: Socio-Economic Variables and Trends

### Demography

- Population: Across all LGAs partially or wholly within the Gwydir River catchment there was a net one percent loss in population i.e. a net migration out of the catchment between 2000 and 2005. During this time population fell from 95,551 to 94,609 people. State wide the population grew over this same period. Population projections for the Border region, which includes the Gwydir River catchment, are more optimistic for the period to 2011 and 2016.
- Age distribution: As at 30 June 2005 the age of residents in the Gwydir River valley was broadly consistent with that of NSW as a whole.
- Housing tenure: The proportion of dwellings fully owned, being purchased or rented in the North West Statistical Division, which includes the Gwydir River catchment, is similar to suburban Sydney and the rest of NSW.
- Skills and education: The North West Statistical Division has fewer persons with higher level post secondary schooling qualifications (eg bachelor degrees) than the state average but more lower level (certificate) qualifications.
- Compared with the average for NSW (5%), Gwydir River LGAs have a strong indigenous presence in the government school system. 47% and 39% of the students in Walgett and Moree Plains respectively are indigenous children. One half the population of high school age children attend boarding schools outside the region.
- Ethnic background: The population of the Gwydir River Catchment has a higher level of Australian born and English speaking background residents than the whole of NSW.
- Labour force: Employment in North West NSW is strongly dominated by agriculture and forestry relative to the whole of NSW. The unemployment rate in North West NSW is similar to the NSW average and the participation rate is slightly higher. The North West unemployment rate has trended down over time from 8.6% in 1997 to 5.1% in 2005.

### Income

- Individual and household income: Mean net taxable income in the LGAs that make up the Gwydir River catchment is lower than the NSW average.
- It is also likely that living costs, especially costs associated with housing, are lower in the Gwydir River Catchment than the NSW average.

## Social Characteristics

- Resilience: ABS SEIFA indexes are scores that summarise a number of socio-economic variables that represent disadvantage in an area. SEIFA indexes for Gwydir River Catchment LGAs reveal that with the exception of Armidale Dumaresq LGA, other Gwydir LGAs are more disadvantaged than the NSW average. Walgett LGA in the far west of the Gwydir River catchment has the lowest SEIFA index in the Gwydir River valley.
- CEEWPR 2000 note that 'While Moree is at the centre of a highly productive region and is generally seen as prosperous, there is concern about the level of equity and social cohesion in the community. Some sectors of the community have clearly not benefited from the economic growth of the region. One outcome has been the Aboriginal Employment Strategy'.
- Remoteness: Residents of the Gwydir River catchments LGAs typically have access to outer regional centres (eg Moree). Excluding Walgett at the western fringe of the catchment, Gwydir River LGAs have only a small proportion of their population in remote areas.
- Crime and Justice: For a number of recorded criminal incident indicators Gwydir River Valley has higher levels of incidents per 100,000 head of population than the NSW average.

## Future Sustainability

- Possible future developments: Future developments in the Gwydir River catchment will focus on resource sustainability, agricultural efficiency, capacity building and diversification of the region's economic base (Regional Development Board, Moree Plains Shire Council and CEEWPR).

# 1. Study Purpose

The aim of this project was to complete an information audit of socio-economic activities in the Gwydir River catchment of Northern NSW (Figure 2.1). AgEconPlus Pty Ltd completed the project for the NSW Department of Environment and Climate Change (DECC) between April and June 2007.

The objectives of the project were to:

1. Review relevant studies and information about economic and social activities occurring in the Gwydir River catchment; and
2. Identify and evaluate trends in these economic and social activities.

# 2. Background and Scope

## Background

The Gwydir Wetlands are wetlands of international importance listed under the Ramsar Convention. The environmental health of the Wetlands is in a critical state, and in some areas irreversible decline has already occurred. The NSW Wetland Recovery Program is a suite of projects that aims to contribute to the recovery of the Macquarie Marshes and Gwydir Wetlands.

The Wetland Recovery Program projects include water buy-back, water use efficiency, and infrastructure and environmental planning frameworks. There is a wide range of social and economic activities that rely both directly and indirectly on water from the Gwydir River system. In order to understand the implications of reallocating water from consumptive users to the environment it is necessary to have a good understanding of the socio-economic landscape within the Gwydir River catchment.

## Scope

The following figure shows local government areas (LGAs) either partially or wholly within the Gwydir River Catchment. The LGAs and their approximate percentage in the catchment are:

Irrigation Dependent i.e. below Copeton Dam

- Gwydir 60% (formally Bingara 100% and Yallaroi 40%)
- Moree Plains 70%
- Narrabri 15%

Above Copeton Dam

- Armidale Dumaresq 10%
- Inverell 10%
- Guyra 50%
- Uralla 80%
- Walgett 10%

Centre for Ecological Economics and Water Policy Research (CEEWPR) University of New England (UNE) (2000) also included Barraba in the Gwydir Catchment. Previous data surveys by Morison and Bennett (1997) for NSW EPA (now DECC) include only

Bingara, Guyra, Moree Plains and Uralla. Where these alternative data sources are used (typically historical information) the difference in coverage is noted.

The former LGAs of Bingara and Yallaroi have merged to become ‘Gwydir’ and are reported separately in some data sets and jointly as ‘Gwydir’ in others.

**Figure 2.1 The Gwydir River Catchment map showing local government areas**


Source: www.environment.nsw.gov.au/ieo/Gwydir/map.htm

## 3. Approach to the Study

The study was approached in two parts. The first part was an industry profile and trend analysis. The second part was an analysis of demographic/socio-economic variables and their trends.

The analysis was completed as a desk based exercise and relied on existing information sources. The analysis relied on ABS agricultural census and regional data and the most recent data set available has been used. A complete list of references sourced and employed has been provided.

Gross economic value estimates are reported. These data can be used to estimate producers' surplus if required. Producers' surplus is the equivalent to net return or profit after deducting employed labour and non-factor expenses from revenue. The national input-output table (ABS 1997) suggests a range of net returns for various sectors of the economy, these include (ratio of gross operating surplus to output):

- Intensive animals i.e. pigs, poultry, etc 1 to 26%
- Broadacre agricultural activities including livestock and crop production 10-20%
- Other agriculture eg horticulture 33%
- Services to agriculture 6%
- Forestry 4%
- Mining i.e. coal, oil, gas and iron ores 52% to 56%
- Non ferrous metal ores and other mining 24% to 32%
- Services to mining 11%

These ratios of gross operating surplus to output can be used as proxies for producers' surplus where more precise estimates are not provided.

# PART A: INDUSTRY PROFILES AND TRENDS

## 4. Agriculture - General

For each major irrigated and dryland agricultural commodity the following data or commentary was requested and provided:

- Numbers of establishments (provided but not requested)
- Production volume (provided but not requested)
- Gross value
- Value added and farm income
- Employment
- Farm assets, land, other farm and non farm assets (ABARE data)
- Additional water to Gwydir wetlands – impact on this activity
- Trends in this activity
- Drought impact (where available)
- Validity of data provided

Unless otherwise indicated these data were sourced from ABS and are therefore highly valid.

## Agricultural Establishments

**Table 4.1: Agricultural Establishments by Type – 1995-96**

| 1995-96 | Bingara | Yallaroi | Guyra | Uralla | Moree Plains | Total |
|---|---|---|---|---|---|---|
| Apple & Pear Growing (No.) | 0 | 0 | 0 | 9 | 0 | 9 |
| Beef Cattle Farming (No.) | 59 | 73 | 66 | 34 | 57 | 289 |
| Cotton Growing (No.) | 2 | 11 | 0 | 0 | 128 | 141 |
| Grain Growing (No.) | 1 | 92 | 1 | 0 | 221 | 315 |
| Grain-Sheep & -Beef Farming (No.) | 24 | 109 | 5 | 3 | 144 | 285 |
| Horse Farming (No.) | 2 | 0 | 3 | 4 | 1 | 10 |
| Livestock Farming nec (No.) | 5 | 4 | 14 | 5 | 5 | 33 |
| Pig Farming (No.) | 4 | 2 | 0 | 0 | 4 | 10 |
| Plant Nurseries (No.) | 0 | 1 | 0 | 0 | 0 | 1 |
| Sheep Farming (No.) | 17 | 12 | 110 | 98 | 23 | 260 |
| Sheep-Beef Cattle Farming (No.) | 42 | 18 | 161 | 104 | 28 | 353 |
| Stone Fruit Growing (No.) | 0 | 0 | 0 | 1 | 0 | 1 |
| Vegetable Growing (No.) | 0 | 0 | 10 | 0 | 1 | 11 |
| Total (ASIC/ANZSIC 01) (No.) | 158 | 324 | 372 | 261 | 618 | 1,733 |

Source: ABS via EPA/DEC spreadsheet (95 FARM Nos. worksheet in GWYDIR.xls)
NB: This data also available for 1994, 1993, 1992 in EPA/DEC spreadsheet GWYDIR.xls.

**Table 4.2: Agricultural Establishments by Type – 2000-01**

| 2000-2001 | Bingara | Yallaroi | Guyra | Uralla | Moree Plains | Total |
|---|---|---|---|---|---|---|
| Apple & Pear Growing (No.) | 0 | 0 | 0 | 14 | 0 | 14 |
| Beef Cattle Farming (No.) | 132 | 201 | 277 | 206 | 289 | 1105 |
| Cotton Growing (No.) | 0 | 20 | 1 | 0 | 155 | 176 |
| Grain Growing (No.) | 38 | 185 | 11 | 18 | 458 | 710 |
| Grain-Sheep & -Beef Farming (No.) | | | | | | 0 |
| Horse Farming (No.) | 10 | 6 | 14 | 11 | 14 | 55 |
| Livestock Farming nec (No.) | 6 | 5 | 12 | 5 | 2 | 30 |
| Pig Farming (No.) | 4 | 3 | 1 | 0 | 1 | 9 |
| Plant Nurseries (No.) | 1 | 5 | 0 | 5 | 7 | 18 |
| Sheep Farming (No.) | 68 | 83 | 306 | 219 | 146 | 822 |
| Sheep-Beef Cattle Farming (No.) | | | | | | 0 |
| Stone Fruit Growing (No.) | 0 | 0 | 0 | 22 | 1 | 23 |
| Vegetable Growing (No.) | 0 | 1 | 16 | 0 | 0 | 17 |
| Total | 259 | 509 | 638 | 500 | 1,073 | 2,979 |

Source: ABS Agricultural Census data 2001

The 2001 ABS data set is more comprehensive than the 1996 set shown in Figure 4.1.

## Production Volume and Value

**Table 4.3: Area of Agricultural Crop Production – 2000-01 (ha)**

| Area (Ha) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Total Area of Agricultural Holding | 205,295 | 314,010 | 1,566,003 | 242,648 | 2,327,955 | 61,008,553 |
| Crops and Pastures For Hay | 1,182 | 537 | 6,329 | 1,026 | 9,075 | 378,081 |
| Total Area: Crops Excluding Pastures | 9,013 | 1,745 | 511,948 | 3,119 | 525,824 | 4,756,721 |
| Total Area Irrigated | 639 | 116 | 47,602 | 125 | 48,482 | 637,798 |
| Area Barley For Grain | 996 | 84 | 64,576 | 0 | 65,656 | 593,172 |
| Area Grain Sorghum For Grain | 396 | 0 | 58,740 | 15 | 59,151 | 170,723 |
| Area Oats For Grain | 1,743 | 490 | 3,997 | 1,415 | 7,644 | 505,062 |
| Area Wheat For Grain | 3,231 | 292 | 256,858 | 72 | 260,452 | 2,328,309 |
| Area Lupins | 0 | 2 | 0 | 32 | 34 | 91,728 |
| Area Oats For Hay | 111 | 123 | 354 | 365 | 953 | 76,375 |
| Area Lucerne Pasture For Hay | 703 | 104 | 704 | 78 | 1,589 | 111,564 |
| Area Total Pasture For Hay | 754 | 318 | 1,600 | 509 | 3,181 | 254,391 |
| Area Cotton | 552 | 0 | 75,486 | 0 | 76,038 | 194,966 |
| Area Sunflower | 0 | 0 | 5,278 | 0 | 5,278 | 34,462 |
| Area Onions | 0 | 0 | 10 | 0 | 10 | 749 |
| Area Potatoes | 0 | 123 | 0 | 0 | 123 | 7,168 |
| Area Tomatoes | 1 | 0 | 0 | 0 | 1 | 1,819 |
| Area (Sq Km) | 2,850 | 4,400 | 17,902 | 3,227 | 28,379 | 800,725 |

Source: ABS via EPA/DEC spreadsheet (A1 worksheet in Gwydir.xls)

Cropping area is dominated by wheat for grain (260,000 ha) then cotton production (76,000 ha), barley (66,000 ha) and sorghum (59,000 ha).

**Table 4.4: Area of Agricultural Crop Production – 1995-96 (ha)**

| Area (Ha) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Total Area of Agricultural Holding | 227,070 | 334,223 | 1,627,552 | 288,885 | 2,477,730 |
| Crops and Pastures For Hay | 954 | 435 | 2,109 | 618 | 4116 |
| Total Area: Crops Excluding Pastures | 10,837 | 2,915 | 720,237 | 3,737 | 737,726 |
| Total Area Irrigated | 235 | 74 | 114,481 | 688 | 115,478 |
| Area Barley For Grain | 802 | 222 | 51,784 | 55 | 52,863 |
| Area Grain Sorghum For Grain | 530 | 0 | 89,172 | 35 | 89,737 |
| Area Oats For Grain | 874 | 312 | 3,330 | 203 | 4,719 |
| Area Wheat For Grain | 1,389 | 133 | 348,894 | 209 | 350,625 |
| Area Lupins | 41 | 0 | 0 | 12 | 53 |
| Area Oats For Hay | 156 | 42 | 1,363 | 273 | 1,834 |
| Area Lucerne Pasture For Hay | 590 | 6 | 369 | 91 | 1,056 |
| Area Total Pasture For Hay | 766 | 394 | 523 | 345 | 2,028 |
| Area Cotton | 0 | 133 | 134,390 | 0 | 134,523 |
| Area Sunflower | 0 | 0 | 4,273 | 0 | 4,273 |
| Area Onions | 0 | 0 | 0 | 0 | 0 |
| Area Potatoes | 0 | 72 | 0 | 0 | 72 |
| Area Tomatoes | 0 | 5 | 0 | 0 | 5 |
| Area (Sq Km) | 2,850 | 4,400 | 17,902 | 3,227 | 28,379 |

Source: ABS Agricultural Census data 2001

**Table 4.5: Value (Gross) of Agricultural Crop Production 1996**

| Value ($'000) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Wheat For Grain | 1,131 | 176 | 105,298 | 38 | 106,643 | 1,121,396 |
| Barley For Grain | 295 | 35 | 20,916 | 0 | 21,247 | 231,606 |
| Grain Sorghum For Grain | 315 | 0 | 22,480 | 6 | 22,800 | 93,763 |
| Oats For Grain | 303 | 96 | 583 | 272 | 1,255 | 121,721 |
| Total Cereals for Grain | 2,085 | 325 | 150,245 | 378 | 153,033 | 1,885,127 |
| Lucerne Pasture For Hay | 408 | 136 | 177 | 82 | 803 | 83,628 |
| Oats For Hay | 83 | 91 | 102 | 132 | 409 | 36,057 |
| Total Pasture for Hay | 427 | 191 | 454 | 186 | 1,258 | 133,181 |
| Total Crops for Hay | 214 | 169 | 1,334 | 199 | 1,916 | 52,942 |
| Total Legumes For Grain | 76 | 0 | 6,621 | 4 | 6,701 | 44,603 |
| Apples | 0 | 0 | 0 | 562 | 562 | 69,510 |
| Total Citrus | 0 | 0 | 112 | 0 | 112 | 82,854 |
| Total Fruit | 0 | 0 | 1,814 | 643 | 2,457 | 459,771 |
| Total Fruit (excl. Grapes) | 0 | 0 | 1,814 | 643 | 2,457 | 327,267 |
| Total Stone Fruit | 0 | 0 | 0 | 39 | 39 | 55,283 |
| Total Cotton | 1,450 | 0 | 238,396 | 0 | 239,846 | 665,370 |
| Sunflowers | 0 | 0 | 1,548 | 0 | 1548 | 13,278 |
| Onions | 0 | 0 | 104 | 0 | 104 | 7,279 |
| Potatoes | 0 | 493 | 0 | 0 | 493 | 49,803 |
| Tomatoes | 0 | 0 | 0 | 0 | 0 | 16,502 |
| Total Vegetables | 0 | 529 | 111 | 0 | 640 | 21,3618 |
| Total Crops (excl. Pastures and Grasses) | 3,845 | 1,147 | 402,099 | 1,242 | 408,333 | 3,699,680 |
| Total Crops (incl. Pastures and Grasses) | 4,272 | 1,426 | 402,633 | 1,428 | 409,759 | 3,840,838 |
| Total Agriculture | 14,557 | 33,242 | 442,788 | 24,825 | 515,412 | 7,068,316 |

Source: ABS via EPA/DEC spreadsheet (A1 worksheet in Gwydir.xls)
NB: this data also available for 1991 and 1986 in Gwydir.xls
NB: this data also available for 1993, 94 and 96 in GWYDIR.xls

Drought and additional allocation of water to the environment has reduced and will continue to reduce the area allocated to irrigation (48,000 ha in 1996 which was a drought year) and increase the area allocated to dryland wheat, barley and sorghum production.

The area allocated to irrigation peaked in 1998/99 and again in 2001/02 (90,000 ha). The forecast for 2006/07 is for an irrigation area of 36,000 ha.

Year 2006 Agricultural census data, available 28 November 2007 is expected to confirm these general statements in greater detail.

**Table 4.6: Livestock Production Volume – 1992, 1993, 1994, 1995 and 1996**

| | Bingara | Yallaroi | Guyra | Uralla | Moree Plains | Total |
|---|---|---|---|---|---|---|
| 1992 | | | | | | |
| Beehives (No.) | 690 | | 2,640 | 640 | | 3,970 |
| Cattle and Calves (No.) | 52,406 | 96,305 | 102,909 | 53,822 | 177,216 | 482,657 |
| Sheep Shorn (No.) | 247,917 | | 832,820 | 831,888 | | 1,912,625 |
| Sheep and Lambs (No.) | 228,101 | 321,226 | 900,751 | 793,378 | 1,053,263 | 3,296,719 |
| Shorn Wool (Kg) | 1,118,993 | | 3,325,754 | 3,326,344 | | 7,771,091 |
| Pigs (No.) | 2,409 | 4,458 | 145 | 609 | 2,159 | 9,779 |
| 1993 | | | | | | |
| Beehives (No.) | 860 | | 3,210 | 775 | | 4,845 |
| Cattle and Calves (No.) | 47,865 | 86,845 | 101,646 | 50,676 | 159,809 | 446,841 |
| Sheep Shorn (No.) | 201,755 | | 706,225 | 739,567 | | 1,647,547 |
| Sheep and Lambs (No.) | 187,322 | 245,800 | 804,700 | 713,756 | 805,950 | 2,757,528 |
| Shorn Wool (Kg) | 901,375 | | 2,719,093 | 2,886,613 | | 6,507,081 |
| Pigs (No.) | 2,013 | 4,013 | 129 | 195 | 1,943 | 8,293 |
| 1994 | | | | | | |
| Beehives (No.) | 860 | 590 | 3,894 | 690 | 523 | 6,557 |
| Cattle and Calves (No.) | 52,984 | 91,241 | 102,452 | 52,124 | 175,134 | 473,935 |
| Sheep Shorn (No.) | 182,801 | 248,539 | 632,209 | 652,453 | | 1,716,002 |
| Sheep and Lambs (No.) | 177,739 | 209,157 | 757,574 | 706,868 | 670,693 | 2,522,031 |
| Shorn Wool (Kg) | 876,107 | 995,540 | 2,559,771 | 2,628,520 | | 7,059,937 |
| Pigs (No.) | 3,193 | 4,515 | 156 | 14 | 2,087 | 9,965 |
| 1995 | | | | | | |
| Beehives (No.) | 890 | 210 | 3,005 | 1,040 | 500 | 5,645 |
| Cattle and Calves (No.) | 60,378 | 96,209 | 98,636 | 51,521 | 177,040 | 483,784 |
| Sheep Shorn (No.) | | | | | | N/a |
| Sheep and Lambs (No.) | 140,925 | 180,439 | 689,596 | 652,711 | 591,639 | 2,255,310 |
| Shorn Wool (Kg) | | | | | | N/a |
| Pigs (No.) | 2,594 | 3,680 | 88 | 342 | 1,782 | 8,486 |
| 1996 | | | | | | |
| Beehives (No.) | | | | | N/a | |
| Cattle and Calves (No.) | 57,937 | 90,507 | 106,016 | 57,225 | 170,657 | 482,342 |
| Sheep Shorn (No.) | | | | | | N/a |
| Sheep and Lambs (No.) | 134,235 | 185,517 | 689,073 | 636,661 | 592,248 | 2,237,734 |
| Shorn Wool (Kg) | | | | | | N/a |
| Pigs (No.) | 1,706 | 3,193 | 17 | 5 | 5,214 | 10,135 |
| 2001 | | | | | | |
| Beehives (No.) | | | | | | |
| Cattle and Calves (No.) | 62,470 | 92,279 | 102,351 | 71,090 | 145,589 | 473,779 |
| Sheep Shorn (No.) | 107,009 | 117,591 | 688,696 | 783,842 | 312964 | 2,010,102 |
| Sheep and Lambs (No.) | 100,568 | 117,760 | 733,061 | 792,750 | 299,449 | 2,043,588 |
| Shorn Wool (Kg) | 474,176 | 486,217 | 2,462,487 | 2,827,761 | 1370114 | 7,620,755 |
| Pigs (No.) | 3,390 | 131 | 40 | 4,730 | 1,843 | 10,134 |

Source: ABS via EPA/DEC spreadsheet (LIVESTOCK_PRODN worksheet in GWYDIR.xls)

**Table 4.7: Livestock Production Value – 1992, 1993, 1994, 1995 and 2001 ($'000)**

| | Bingara (A) | Yallaroi (A) | Guyra (A) | Uralla (A) | Moree P. (A) | Total |
|---|---|---|---|---|---|---|
| 1992 | | | | | | |
| Value Livestock Products | 3,752 | 5,726 | 11,662 | 12,340 | 16,839 | 50,319 |
| Value Livestock Slaughterings | 8,338 | 24,350 | 16,630 | 10,768 | 34,138 | 94,224 |
| Cattle and Calves Slaughterings | 7,343 | 22,166 | 13,313 | 8,892 | 30,442 | 82,156 |
| Pigs Slaughterings | 344 | 917 | 20 | 21 | 577 | 1,879 |
| Poultry Slaughterings | 143 | | | | | 143 |
| Sheep and Lamb Slaughterings | 480 | 1,009 | 3,175 | 1,758 | 2,860 | 9,282 |
| | | | | | | |
| 1993 | | | | | | |
| Value Livestock Products | 3,497 | 4,633 | 11,026 | 10,903 | 13,216 | 43,275 |
| Value Livestock Slaughterings | 8,678 | 18,042 | 18,795 | 11,005 | 37,130 | 93,650 |
| Cattle and Calves Slaughterings | 7,285 | 16,032 | 14,825 | 8,763 | 33,486 | 80,391 |
| Pigs Slaughterings | 505 | 1,032 | 39 | 1 | 656 | 2,232 |
| Poultry Slaughterings | 169 | 0 | 0 | 0 | 0 | 169 |
| Sheep and Lamb Slaughterings | 718 | 930 | 3,861 | 2,173 | 2,690 | 10,372 |
| | | | | | | |
| 1994 | | | | | | |
| Value Livestock Products | 3,932 | 5,616 | 19,791 | 18,465 | 16,516 | 64,320 |
| Value Livestock Slaughterings | 8,426 | 23,875 | 17,570 | 10,619 | 33,472 | 93,962 |
| Cattle and Calves Slaughterings | 7,194 | 22,176 | 13,819 | 8,264 | 30,456 | 81,909 |
| Pigs Slaughterings | 767 | 827 | 39 | 78 | 520 | 2,231 |
| Poultry Slaughterings | 0 | 0 | 0 | 0 | 0 | 0 |
| Sheep and Lamb Slaughterings | 396 | 866 | 3,671 | 2,214 | 2,456 | 9,603 |
| | | | | | | |
| 1995 | | | | | | |
| Value Livestock Products | 2,888 | 4,094 | 15,086 | 13,984 | 13,062 | 49,113 |
| Value Livestock Slaughterings | 7,397 | 20,467 | 16,730 | 9,414 | 27,093 | 81,100 |
| Cattle and Calves Slaughterings | 6,130 | 18,683 | 12,067 | 6,576 | 22,633 | 66,088 |
| Pigs Slaughterings | 645 | 699 | 19 | 0 | 1,349 | 2,712 |
| Poultry Slaughterings | | | | | | 0 |
| Sheep and Lamb Slaughterings | 585 | 1,063 | 4,585 | 2,752 | 3,110 | 12,095 |

Source: ABS via EPA/DEC spreadsheet (LIVESTOCK_VALUE worksheet in GWYDIR.xls)

Year 2001 and 2006 (if available) are expected to show a continuation of the switch of livestock resources from shorn wool production toward sheep meat and cattle production and total livestock units similar to 1992 an average season rather than 1995 and 1996 which were drought years.

## Farm Financial Performance

Tables below are for the average of all broadacre farms, NSW North West Slopes and Plains. The NSW North West Slopes and Plains include a large part of northern NSW and is an area of considerable agricultural diversity.

**Table 4.8: ABARE Average Farm Financial Indicators, NSW North West Slopes and Plains - Capital Value, Debt, Farm Business Profit - 2000 to 2006**

| Year | Total capital value ($) | Farm business debt at 30 June ($) | Equity ratio at 30 June (%) | Farm cash income ($) | Profit at full equity ($) | Profit at full equity including capital appreciation ($) | Farm business profit ($) |
|---|---|---|---|---|---|---|---|
| 2000 | 1,958,204 | 287,725 | 84 | 73,122 | 10,753 | 64,676 | (22,262) |
| 2001 | 1,962,960 | 302,748 | 84 | 38,439 | (13,693) | 68,476 | (46,834) |
| 2002 | 2,432,332 | 356,017 | 85 | 150,713 | 98,415 | 192,682 | 69,287 |
| 2003 | 2,312,787 | 294,963 | 86 | (4,624) | (74,000) | 56,694 | (100,649) |
| 2004 | 3,013,199 | 476,971 | 84 | 39,409 | 26,348 | 382,477 | (13,565) |
| 2005 | 2,894,804 | 445,860 | 83 | 102,644 | 82,258 | 232,314 | 44,097 |
| 2006 | 3,469,346 | 507,418 | 85 | 139,842 | 89,841 | 215,524 | 42,115 |

Source: ABARE Farm Survey data (www.abareconomics.com/interactive/farm_surveys)
NB: data available for 1990s as well. May be possible to purchase data for irrigated and non-irrigated properties separately.

NSW North West Slopes and Plains average farm enterprise in 2006 had An estimated total capital value of $3.5 million, debts of $507,000, farm cash income of $140,000 and profit after debt servicing of $42,000.

**Table 4.9: ABARE Farm Financial Indicators, NSW North West Slopes and Plains – Liquid Assets, Family Income and Capital Appreciation - 2000 to 2006**

| Year | Farm liquid assets at 30 June ($) (3) | Imputed labour cost ($) | Total family income ($) (4) | Total non farm income ($) (3) | Total off farm wages ($) (3) | Rate of return including capital appreciation (%) | Rate of return excluding capital appreciation (%) |
|---|---|---|---|---|---|---|---|
| 2000 | 83,234 | 48,782 | 45,151 | 22,444 | 14,744 | 3 | 1 |
| 2001 | 110,646 | 44,965 | 34,467 | 29,256 | 19,503 | 3 | -1 |
| 2002 | 124,440 | 47,745 | 146,075 | 41,685 | 23,144 | 8 | 4 |
| 2003 | 112,879 | 45,019 | - | 32,841 | 10,669 | 2 | -3 |
| 2004 | 139,051 | 52,198 | - | 21,950 | 10,563 | 13 | 1 |
| 2005 | 61,352 | 49,144 | 111,716 | 38,857 | 27,790 | 8 | 3 |
| 2006 | 81,253 | 49,337 | 65,140 | 27,043 | 11,530 | 6 | 3 |

Source: ABARE Farm Survey data (www.abareconomics.com/interactive/farm_surveys)
NB: data available for 1990s as well

The average farm enterprise in 2006 had liquid assets (eg bank deposits) of $81,000, total family income of $65,000 (including $11,500 in off farm wages) and a 3% return on capital excluding capital appreciation.

### Drought

The impact of drought since 2000 is reflected in the above farm financial performance data. Profit at full equity was a loss in both 2001 and 2003. Year 2007 data will be similarly affected by drought.

### Employment

Available employment data for agriculture and other sectors is presented in Chapter 14. Agriculture accounts for one in three jobs (direct plus indirect) in this catchment.

Furthermore it is noted that '…currently there are about 50 Aboriginal people employed directly in the Gwydir Valley cotton industry and this 'beginning' is likely to serve as a model for similar programs in other cotton growing areas' (CEEWPR 2000).

### Additional Water to Gwydir Wetlands – Impact on Dryland Agriculture

The impact of additional water allocation to the Gwydir Wetlands on dryland and irrigated agriculture is reviewed in Chapter 5. There is some potential for expansion of dryland crops, such as cereal, under this scenario.

## 5. Irrigated Agriculture

### Water Use, Production Values and Volume

In the Gwydir River catchment, irrigation water for agriculture is mostly sourced from regulated surface supplies. The Copeton Dam on the Gwydir River is the main irrigation storage and there are six weirs that regulate water along the river (Hope and Bennett 2003).

Cotton is the major irrigated commodity in the catchment. Cotton is grown on the alluvial plains in the centre and west of the catchment. Cereal -wheat, barley, sorghum and maize - is also grown in these areas. Vegetable production is a high value use of Gwydir irrigation water. Pecan nut production around Moree in the west of the catchment is also a significant high value user of irrigation water. In the east lucerne and pasture are grown in the upper catchment along the small alluvial floodplains close to the Gwydir River and its tributaries. The value of irrigated agriculture in the Gwydir Valley 2000/01, as prepared by the NSW Irrigators' Council using ABS Agricultural Census data, is shown in Table 5.1.

**Table 5.1 Value of Irrigated Agriculture in the Gwydir River Catchment - 2001**

| Crop | Total Production that is Irrigated (%) | Value of Irrigated Production ($'million) |
|---|---|---|
| Pastures for stock feed | 59.3 | 4.2 |
| Crops for hay | 24.0 | 0.86 |
| Cereals for grain | 5.7 | 6.0 |
| Other crops | 76.2 | 5.4 |
| Cotton | 80.0 | 178.0 |
| Vegetables | 98.7 | 54.2# |
| Fruit excluding grapes | 57.6 | 1.0 |
| Grapes | 80.2 | 0.35 |
| Livestock slaughterings | 2.4 | 1.6 |
| Livestock products | 7.6 | 2.3 |
| Total | 43.5 | 200.3 |

Source: ABS Agricultural Census 2001 in NSW Irrigators' Council Fact Sheet accessed April 2007
# It is possible that these vegetables are irrigated using water from the river or on farm storage in the upper catchment i.e. this production will not be impacted by the purchase of water for the environment. Data is not available to confirm this possibility.

Historically, the total value of agriculture in 1996/97 was $592 million and $245 million was attributed to irrigation. Of that, $221 million was generated by irrigated cotton (Hope and Bennett 2003). Both the 2001 and 1996/97 estimates do not define which LGAs are included in their valuation. No firm trend should therefore be concluded from this data.

Powell and Chalmers 1995 (in CEEWPR 2000) found that cotton growing and ginning account for more than 20% of the gross output from the region.

**Table 5.2: Summary of Irrigation Data for the Gwydir Catchment by Water Source – 1996-97**

| Water supply | Total irrigated area (ha) | Total water used by irrigated ag. (ML) | No. irrig. licences | No. enterprises irrigating | Yield of major irrig. crop (t/ha)[a] | Value of irrigation ($m) |
|---|---|---|---|---|---|---|
| All sources of water | 57,564 | nd *450,000 (estimate)* | 663 | 92 | 1.6 (cotton) | 245 |
| Regulated | 72,680 | 404,900 | 193 | nd *82 (1993–94)* | 1.6 (cotton) | nd |
| Unregulated | 7,150 | nd *10,000 (avg. 1989–90 - 1994–95)* | 280 | nd *105 (1993–94)* | nd | nd |
| Groundwater | nd *15,152 (1993–94)* | nd *35,747 (avg.)* | 190 | 173 | nd | nd |
| Farm dams | nd *806 (1993–94)* | nd | na | nd *12 (1993–94)* | nd | nd |
| Reticulated | nd *0 (1993–94)* | nd | na | nd *0 (1993–94)* | nd | nd |
| NSW total (all sources of water) | 1,150,000 | 7,700,000 | 24,000 | 7,846 | 1.8 (cotton) | 2,496 |

Source: Hope and Bennett 2003
NB: The discrepancy between Total irrigated area (ha) all sources 57,564 ha and regulated 72,680 ha should be noted when making use of this data source

In 1996–97, ABS figures suggest nearly 60,000 ha were irrigated each year from all sources of water in the Gwydir River valley (that is, groundwater, regulated and unregulated supplies, farm dams and reticulated water supplies). However, that figure may be an underestimate, as the data from the Department of Land and Water Conservation (DLWC) estimate the area irrigated from regulated supplies alone to be 73,000 ha (Hope and Bennett 2003).

The area irrigated varies considerably depending on climate and access to water. For example, anywhere between 7,000 ha and 90,000 ha are planted to cotton each season.

The total volume extracted from all water sources by irrigated agriculture cannot be stated with any accuracy but was estimated to be around 450,000 ML in 1996/97. This volume would vary considerably with climate each year. For example, between 1988–89 and 1993/94, the volume of water used from all sources on cotton alone was estimated to be between 74,400 ML and 413,000 ML (Hope and Bennett 2003).

There are 663 irrigation licences and 92 enterprises irrigating crops in the catchment. Of these, 65 are thought to be irrigating cotton. Cotton yields have ranged from 0.7 t/ha to 1.8 t/ha (1988/89 to 1994/95). Data on yields of irrigated crops other than cotton were scarce. Cotton and cereal crops in the lower catchment are generally watered using surface methods.  In the upper catchment, where lucerne and pasture crops dominate, pressure systems are used (Hope and Bennett 2003).

## Cotton

The following table, sourced from CEEWPR 2000, shows the additional economic importance attributable to irrigated cotton when local ginning is added.  In the absence of ginning, farm gate value of cotton was $221 million in 1996/97.

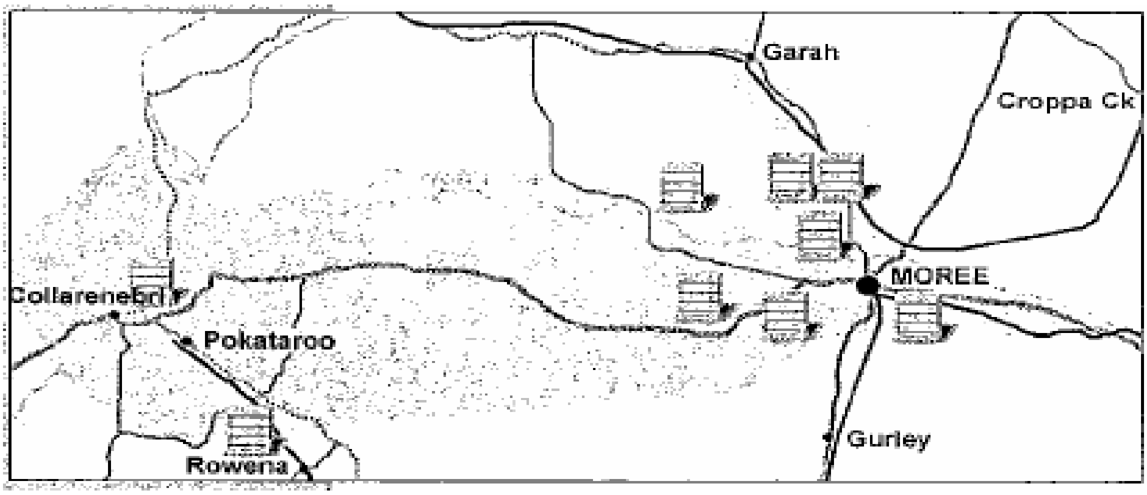
**Table 5.3: Gross Value Agricultural Production including Cotton Ginning, Gwydir Catchment – 1997**

| Enterprise | Gross Value ($'000) | Area (ha) | Livestock (number) |
|---|---|---|---|
| Cotton-Irrigated | 675,936 | 165,484.5 | |
| Cotton Non-irrigated | | 14,429 | |
| Cattle & calf slaughterings | Not Reported | - | Not Reported |
| Wool & skins (estimate) | 123,503 | - | 4,927,605 |
| Grain sorghum | 28,163 | 98,439.9 | |
| Sheep & lamb slaughterings | 27,741 | - | 5,338,074 |
| Wheat | 466,513 | 867,669.3 | |
| Barley | 87,685 | 157,732.1 | |
| Oilseeds | 9,873 | 23,486.7 | |
| Sunflowers | - | 17,883.7 | |
| Chick peas | 9,652 | 25,891 | |
| Oats for grain | 5,007 | 27,336.9 | |
| Soybeans | 3,343 | 3,516.9 | |
| Total | 1,437,415 | 1,401,870 | 10,265,679 |

Source: CEEWPR Gwydir Valley Strategic Planning Study, Regional Profile 2000

Figure 5.1 below shows the location of the nine Gwydir River catchment cotton gins and the concentration of the industry between Moree, Collarenebri and Rowena.

**Figure 5.1: Gwydir River Catchment Cotton Area**




Source: Australian Cottongrower Cotton Yearbook 2006

Cotton production in the Gwydir has been variable. See area and production figures and tables below.

**Table 5.4 Water Diversions, Cotton Production and Area harvested – 1986/87 to 2000/01**

| Year | Total Regulated + Unregulated Diversions ML | Bales of Cotton Produced bales | Hectares Harvested ha |
|---|---|---|---|
| 86/87 | 454,766 | 430,663 | 57,000 |
| 87/88 | 306,785 | 320,590 | 50,000 |
| 88/89 | 294,398 | 372,400 | 53,000 |
| 89/90 | 277,256 | 356,200 | 55,000 |
| 90/91 | 425,923 | 489,100 | 67,000 |
| 91/92 | 302,933 | 549,400 | 67,000 |
| 92/93 | 115,352 | 228,000 | 38,000 |
| 93/94 | 82,805 | 152,000 | 38,000 |
| 94/95 | 90,041 | 49,500 | 7,500 |
| 95/96 | 180,848 | 298,200 | 42,000 |
| 96/97 | 404,786 | 600,600 | 77,000 |
| 97/98 | 508,456 | 688,800 | 82,000 |
| 98/99 | 288,138 | 612,000 | 90,000 |
| 99/00 | 421,894 | 731,000 | 85,000 |
| 00/01 | 359,919 | 675,000 | 89,000 |
| **Averages** | | | |
| 15 year | 300,953 | 436,897 | 59,833 |
| 96/97 to 00/01 | 396,639 | 661,480 | 84,600 |

Source: Wolfenden, Gill & van der Lee (2001)

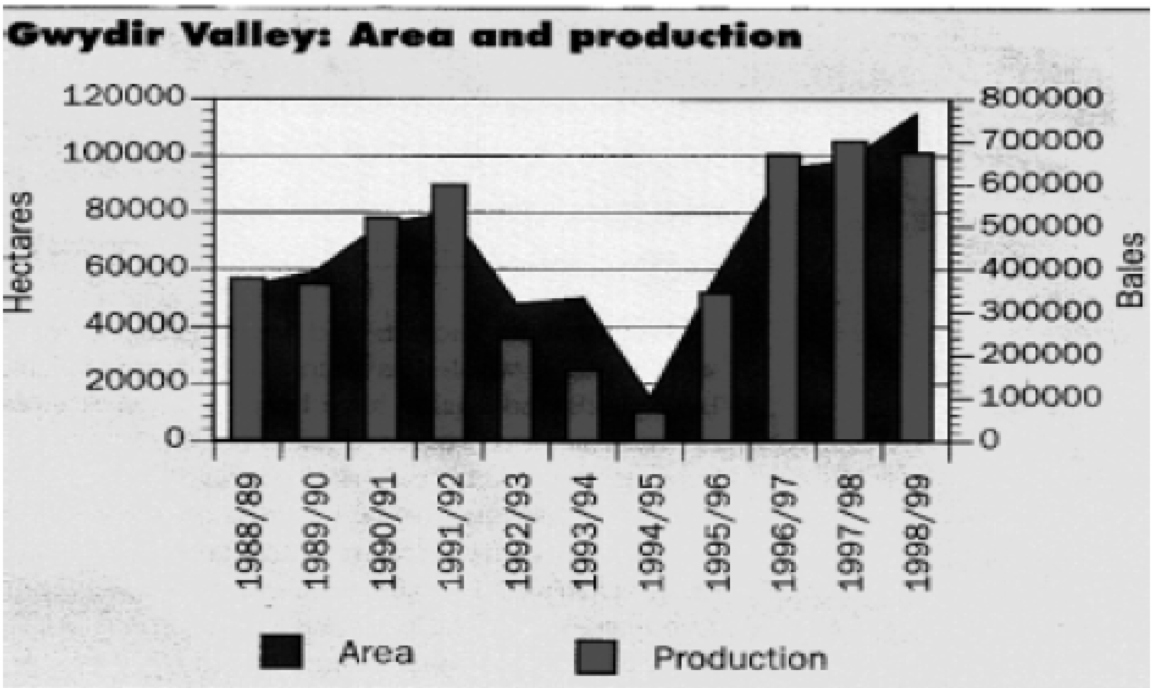
**Table 5.4a Cotton Area and Production 2001/02 and 2006/07 (forecast)**

| Year | Total Diversions (ML) | Production (bales) | Area (ha) |
|---|---|---|---|
| 2001/02 | | 653,000 | 89,500 |
| 2006/07 (f) | | 295,449 | 35,812 |

Source: Cotton Australia 2007 (f) = forecast

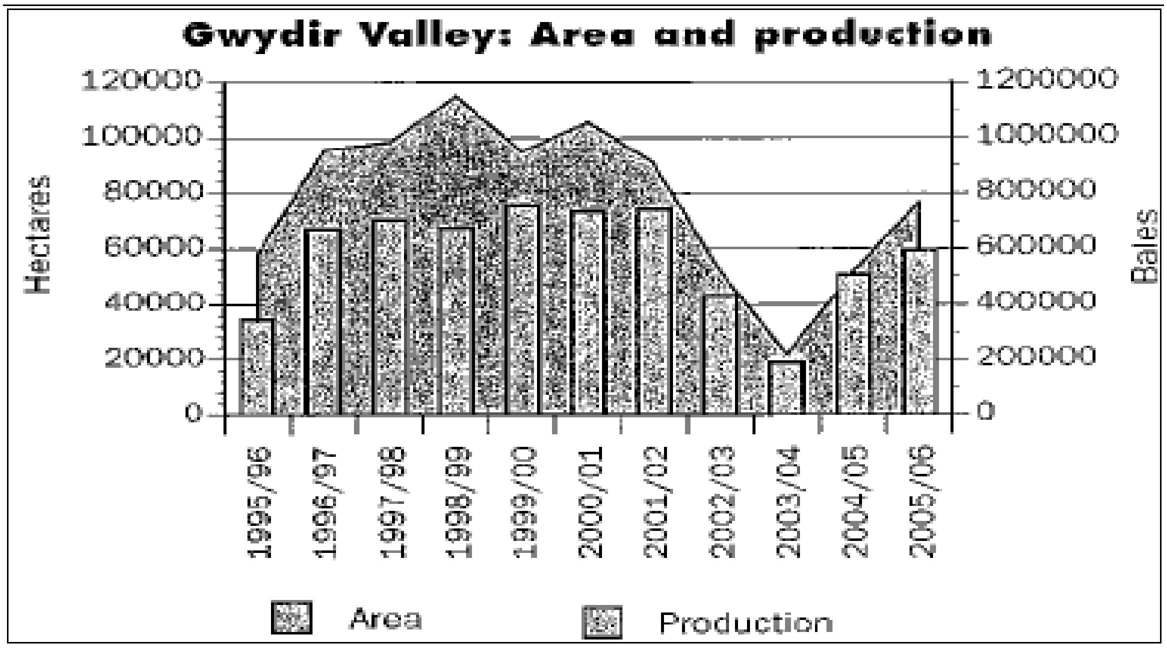
NB: See Figure 5.3 for data to complete the years 2001/02 to 2006/07.

**Figure 5.2: Cotton Area and Production Gwydir Catchment – 1988/89 to 1998/99**




Source: Australian Cottongrower Cotton Yearbook 1999 in CEEWPR 2000

**Figure 5.3: Cotton Area and Production Gwydir Catchment – 1995/96 to 2005/06**




Source: Australian Cottongrower Cotton Yearbook 2006

Average production for the Gwydir River catchment is 600,000 bales. Droughts have severely depressed production in 1992/93, 1993/94, 1994/95 and 2004/05. A modest, drought affected crop of 295,000 bales is forecast for 2006/07.

### Farm Financial Performance

Irrigated Gwydir cotton farm financial performance for year 2005 based on Boyce (2006) is provided in the table below. Cost detail is provided for insight into possible regional expenditure patterns i.e. goods sourced locally and imported. Boyce (2006) does not provide a full cost breakdown for an average Gwydir River valley cotton farm so this data has been provided for an 'average Australian cotton farm'. Again the source is Boyce (2006).

**Table 5.5 Key Indicators, Average Gwydir Cotton Farm 2005**

| | |
|---|---|
| Gross income ($/ha) | 4,717 |
| Insecticides & Bollgard ($/ha) | 383 |
| Wages ($/ha) | 427 |
| Operating Costs | 3,540 |
| Operating profit ($/ha) | 1,177 |
| Hectares grown | 1,064 |
| Yield / ha | 10.37 |

In comparison to the average north west slopes and plains broadacre farm, Gwydir cotton enterprises are larger (total capital value $14.4 million) and generate a higher return on capital (8.7% in 2005).

**Table 5.6 Average All Australian Cotton Farms 2005 (per Ha grown)**

| | | |
|---|---|---|
| **Income** | | |
| Cotton Proceeds - lint | | 4,419 |
| Cotton Proceeds - Seed | | 452 |
| Ginning | | -511 |
| Levies | | -38 |
| Cotton proceeds - Hail Claims | | 48 |
| | Total receipts | 4,370 |
| **Cash Costs ($)** | | |
| Admin | | 45 |
| Cartage | | 96 |
| Chemical Application | | 137 |
| Chemicals- Herbicide | | 153 |
| Chemicals- Insecticides | | 198 |
| Chemicals- Defoliants | | 55 |
| Chemicals- Other | | 5 |
| Chipping | | 44 |
| Consultants | | 58 |
| Contract Picking | | 173 |
| Contract Farming & Ripping | | 57 |
| Cotton Picking Sundries | | 19 |
| Electricity | | 25 |
| Fertiliser | | 242 |
| Fuel and Oil | | 229 |
| Hire of Plant | | 3 |
| Insurance | | 116 |
| Leasing, Depreciation, HP | | 206 |
| Licence Fee - Ingard | | 127 |
| Licence Fee - Roundup Ready | | 16 |
| Motor Vehicle Expenses | | 22 |
| R&M - Farming Plant | | 174 |
| R&M - Pumps and Earthworks | | 114 |
| Seed | | 80 |
| Water Charges | | 113 |
| Wages - Employees | | 321 |
| Wages - Proprietors | | 46 |
| Other Farm Overheads | | 75 |
| | Total costs | 2,949 |
| Operating Profit | | 1,421 |
| Add | | |
| Wages – Proprietors | | 46 |
| Farm Operating Profit | | 1,467 |

Source: Boyce 2006

## Employment

The Gwydir cotton industry has 173 growers and approximately 850 other employees on cotton farms. In addition there is much casual labour employed during the growing season and in processing the crop at nine cotton gins in the valley (CEEWPR 2000).

As a rule of thumb, cotton growing employs 9-10 permanent people per 1,000 ha (CEEWPR 2000). Each of the cotton gins employs about 25 people for the duration of the ginning season (CEEWPR 2000).

## Trends

The region's agriculture can be described and understood in terms of contrasts between such things as the past and the present, irrigation and dryland, the upper and lower catchment, good years and bad years, large and small farms and exploitative versus sustainable practices (CEEWPR 2000).

Gwydir Valley agriculture has evolved considerably over its 150-year history. Throughout this period, the production of commodities has become increasingly reliant on capital inputs. In the early years, the major inputs were land and labour while capital and technical management played relatively minor roles. Today, there is a heavy reliance on purchased inputs with land and labour becoming relatively less important. This trend, involving substitution of one input for another, has been effective in maintaining gross output despite some 'mining' of the natural fertility of the land. But at the same time, it has put heavy demands on the financial and managerial skills of producers and increased exposure to financial losses (CEEWPR 2000).

Nowhere is the trend toward capital-intensive agriculture better illustrated than in the case of irrigation. By allowing an optimal quantity of water to be applied when and where it is needed, irrigation is able to combine a large number of inputs to generate high margins (CEEWPR 2000).

Irrigation also sharpens the lines that divide regions and incomes. Before the development of irrigation, land use patterns in the whole of the Gwydir Valley were relatively homogeneous with landholders from one end of the catchment to the other practising 'mixed, dryland farming'. In those times, differences in performance between farms and areas might be better explained in terms of rainfall, farm size or managerial ability than enterprise mix. With large-scale development of irrigation, however, strong contrasts have developed between holdings that have and those that do not have access to irrigation water (CEEWPR 2000).

Recently there has been a strong trend toward stagnant cotton prices, increases in production costs and the need to drive, even harder, the fight for productivity improvement. Although a long-term view is essential, if the industry is in for a period of sustained reduced return on assets, and potentially low capital growth, growers must continually look at alternative investments (Boyce 2006).

## Drought Impacts

Sourced from Cotton Australia, the industry's peak body (Cotton Australia 2007) the following is presented without independent verification:

- Of all the agricultural commodities Australia produces, cotton is probably the worst affected by the drought in the 2006/07 season. While some sectors have been supported by higher prices during the dry conditions, cotton has suffered the double whammy of low, stagnant prices and significantly lower production *(source: Australian Agriculture in Focus Report, Rabobank, January 2007).*
- Cotton Australia currently estimates a national 2006/07 crop of 1.172 million bales.
- This estimate will see the smallest area planted in 20 years, a 66% reduction compared to five years ago (considered a 'normal' year).
- The crop has been half its usual size for three of the past five years.
- The worst affected areas in NSW are Menindee (100% reduction in area), Bourke (99% reduction), Walgett (95% reduction), the Macquarie (74% reduction) and the Gwydir (60% reduction).
- Cotton's water use fell by 37% between 2000/01 and 2004/05, due mainly to drought *(Source: ABS Water Account Australia 2004/05).*
- A drought impact study of businesses in one cotton community (Wee Waa) in 2004, compared to 2001 found:
    - Gross turnover of the combined businesses surveyed fell by 47%
    - Permanent staff numbers fell to 69%, casual staff numbers fell to 52% with one third of these leaving the region
    - Primary School numbers declined by 57 students (15%)

Chief Executive of the Gwydir Valley Irrigators Association, Michael Murray, is reported in the Sydney Morning Herald 21 April 2007 ('Pain, gain as farmers forced to go with the flow') as saying 'enough water was stored in the catchment to guarantee high security irrigation (without further rain) – used for permanent plantings – for nearly two years. The valley's biggest high security water user is a pecan nut farm outside Moree with about 70,000 trees. There is not enough water for the general security allocations used to grow cotton.' Again the statement is provided without independent verification.

**Table 5.7 2006/07 Water Allocations – New South Wales Cotton Areas**

| River Valley | Actual Valley Percentage of Water Available (including water carried over from 2005/06 | Allocations Announced to Date for 2006/07 |
|---|---|---|
| Murray | 27% | 0% |
| Murrumbidgee | 12% | 15% |
| Macquarie | 28% | 0% |
| Namoi Valley | 20% | 0% |
| **Gwydir Valley** | **20%** | **0%** |
| Border Rivers | 45% | 0% |
| Lachlan | 15% | 0% |

* Data taken from NSW Storage Allocation Report, Oct 06 - NSW Water
Source: Cotton Australia (2007)

**Table 5.8 Historical Water Allocation for the Gwydir 1986/87 to 2000/01**

| Year | Entitlement ML | Regulated Allocation % | Regulated Allocation ML |
|---|---|---|---|
| 86/87 | 518,000 | 85 | 440,300 |
| 87/88 | 518,000 | 23 | 119,140 |
| 88/89 | 518,000 | 35 | 181,300 |
| 89/90 | 518,000 | 22 | 113,960 |
| 90/91 | 518,000 | 80 | 414,400 |
| 91/92 | 518,000 | 35 | 181,300 |
| 92/93 | 518,000 | 5 | 25,900 |
| 93/94 | 518,000 | 0 | 0 |
| 94/95 | 518,000 | 0 | 0 |
| 95/96 | 518,000 | 18 | 93,240 |
| 96/97 | 518,000 | 75 | 388,500 |
| 97/98 | 518,000 | 82 | 424,760 |
| 98/99 | 518,000 | 100 | 518,000 |
| 99/00 | 518,000 | 100 | 518,000 |
| 00/01 | 518,000 | 100 | 518,000 |
| 15 year average | | 51 | 262,453 |

Source: Wolfenden, Gill & van der Lee (2001)

**Table 5.9 Water Allocation Announcements Over the Last Five Years - NSW Cotton Areas, Regulated Rivers**

| | 02/03 | 03/04 | 04/05 | 05/06 | 06/07 | Average |
|---|---|---|---|---|---|---|
| Macquarie | 0% | 19% | 9% | 44% | 0% | 14% |
| Namoi | 0% | 46% | 14% | 31% | 0% | 18% |
| Murrumbidgee | 38% | 41% | 37% | 54% | 7% | 35% |
| **Gwydir** | **0%** | **30%** | **3%** | **22%** | **0%** | **11%** |
| Lachlan | 3% | 0% | 0% | 15% | 0% | 4% |

Source: Cotton Australia (2007)

Review of the data would indicate that the often claimed 600,000 bale average Gwydir River crop is inappropriate. Review of the Table 5.8 data would indicate:

- 7 good years;
- 4 poor years; and
- 4 very poor years.

## Additional Water to Gwydir Wetlands – Agricultural/Environmental Tradeoffs

This section addresses the impact on irrigation of additional water allocation for the Gwydir Wetlands by providing reviews of relevant literature and models. Studies of significance are presented in chronological order.

*Water Use Trade-offs in the Macquarie and Gwydir Valleys,* Morison and Bennett 1997

Overview of tradeoffs is presented in qualitative terms together with a recommendation that environmental valuation be pursued to better quantify water allocation tradeoffs.

*A Social and Economic Assessment of the Likely Impacts Resulting from Changes to Irrigation Water Allocations in the Gwydir Valley,* Wolfenden, Gill & van der Lee 2001

Study prepared for the Gwydir Valley Irrigators' Association. Findings reported in Wolfenden 2002 below.

*Some Social and Economic Issues Stemming from Water Reform Processes in Cotton Growing Areas of Australia*, Wolfenden 2002

Paper prepared for the 11$^{th}$ Australian Cotton Conference in Brisbane. The paper addresses the impact on cotton of NSW water reform processes, the cap on diversions in the Murray Darling Basin and sustainable groundwater use objectives. It identifies the general impact of these changes as the reduction in water for irrigation purposes with a consequent reduction in agricultural production. The paper raises the prospect that reduced irrigation allocations will tend to stimulate higher water use efficiency.

Wolfenden notes cotton production is a significant portion of total economic activity in the Gwydir. His paper cites Powell and Chalmers (1995) input-output regional model which found that irrigation contributes about 20% of overall regional economic activity in terms of gross output and value added and around 8%[1] in terms of employment and household income. In terms of reductions in water allocation, Powell and Chalmers (1995) reported there:

> … would be a reversal of the intensification process observed over the past decade or more. There would be a consequent downward adjustment in the overall size of the regional economy in the absence of significant growth from other business opportunities. There are no significant (opportunities) apparent at this time that could replace the contribution of cotton in a normal[2] season (Powell and Chalmers 1995, p.4).

Changes that place downward pressure on production could result in considerable negative short-term economic impacts at regional and local levels. Longer-term impacts are not clear due to possible adjustments through improved technologies and investment mixes. Furthermore, the short-term view excludes any adverse longer-term impacts of cotton production on the agricultural resource base which may feed back to actually reduce the productivity of specific agricultural regions.

[1] It is noted that this appears to be high for a capital intensive industry.
[2] The lack of 'normal' seasons is noted in Table 5.7

In Wolfenden, Gill & van der Lee (2001), it was found that for a real reduction in irrigation water by 34,000 ML or 10 per cent, the average annual per megalitre effects would be as follows:

- $148 / ML in Net Social Benefit terms;
- $591 / ML in Gross Value of Production; and
- $448 / ML total flow-on effects to local economy (i.e. the money that stays in local area).

The paper concluded that all of the above figures are contestable – they depend on assumptions about product prices and technology, as well as assuming steady levels of investment in capacity. A different set of assumptions, the paper reports, will yield a different set of numbers.

*Economic Impacts of Draft Water Sharing Plans*, ACIL 2002

Study prepared for NSW Department of Land and Water Conservation to provide an independent review of Draft Water Sharing Plans (DWSP). Study identified larger proportional changes in the Gwydir relative to other NSW river valleys and larger losses again in a 1-in-50 dry year. On a statewide basis the impacts of DWSPs are very small.

**Table 5.10 Annual Water Losses and Economic Impacts Associated with Draft Water Sharing Plans in the Gwydir River Valley**

| Scenario | Av Extractive Water Loss (GL/yr) | Economic Impacts | | |
|---|---|---|---|---|
| | | Agricultural Value Added Lost ($m) | Regional Value Added Loss ($m) | Regional Employment Loss (FTE) |
| Normal Year | 7 | 1.1 | 2.3 | 23 |
| 1-in-50 Year | 17 | 2.7 | 5.5 | 55 |

Source: ACIL 2002

*Development of a Decision Support System for the Namoi and Gwydir Valleys,* Letcher, and Aluwihare. (2004)

The Integrated Catchment Assessment and Management (iCAM) Centre at the Australian National University has prepared decision support software for the Gwydir River catchment. The decision support software is designed to assist industry representatives and state government agency staff in considering the impacts of water allocation policies on water users and the environment in the Gwydir River catchment (the model is also calibrated for the Namoi River Catchment). The software is complete with user-friendly interfaces, a support manual and training workshops. The model is a further refinement of a PhD project and is a credible tool. Model data assumptions (i.e. production areas and water use) will require update with Gwydir Valley producers but this is not a major task (Dr Rebecca Letcher *pers comm.*)

*Economic Impacts of NSW Government Water Purchases for the Environment,* BDA Group 2006

Paper prepared for the NSW Natural Resources Commission. The NSW Government has recognised that historical overuse of water has affected the health of rivers and wetlands and that there are long term benefits to the state through sustainable water use and healthy waterways. Securing these benefits comes at a cost including the opportunity cost of foregone irrigation activity. Adopting a market based approach to securing water for the environment ensures that water is sourced from its lowest value-added production. At the regional level reductions in gross value of regional production caused by reallocation to the environment will be offset by growth in non-irrigated agricultural production. Offsetting growth in non-irrigated agricultural production is not described in and detail.

Factors that will affect the cost of transferring water from irrigators to the environment include:

- The price of irrigation water including its reflection of irrigators' expectations;
- The scale of purchases, larger transfers will have higher opportunity costs;
- The type of water right purchased e.g. permanent versus temporary transfers;
- Whether water entitlements purchased are traded or not;
- The acquisition process;
- Where water is purchased; and
- When water is purchased.

Ultimate economic costs will depend on how well purchasing agencies interact in established water markets and through their strategic management of environmental water holdings.

Issues that affect the economic impact of government buybacks include:

- The opportunity cost of water;
- The price responsiveness of demand;
- Seasonal conditions;
- Long-term supply constraints;
- Trade effects;
- The scale of buybacks;
- The profile of water sought;
- The purchasing of water to add to a portfolio; and
- Third party impacts.

The economic cost of transferring water from irrigated production can be inferred from market prices for irrigation water and assumed price increase effects. Estimated economic costs on irrigated industries for northern NSW catchments as a result of government water purchases are shown in the table below. Impacts are shown for both a low and high flow scenario, reflecting the possibility of additional funding for Riverbank from the Australian Government Water Fund (AGWF) and the range of purchases under the Living Murray of 80 GL to 125 GL.

**Table 5.11 Economic Costs (lost production) from Water Purchases**

| | Low scenario | | | High scenario | | |
|---|---|---|---|---|---|---|
| | ML | Price effect ($ per entitlement) | Economic cost $m | ML | Price effect ($ per entitlement) | Economic cost $m |
| Macquarie | 30,057 | $64 | $41.5 | 44,084 | $95 | $61.6 |
| Gwydir | 3,061 | $16 | $8.3 | 9,442 | $49 | $25.8 |
| Border Rivers (Narran) | 10,182 | $5 | $5.4 | 41,034 | $16 | $21.9 |
| Lachlan | 10,005 | $11 | $6.6 | 10,005 | $11 | $6.6 |
| ***Total*** | 53,305 | | $61.8 | 104,565 | | $115.9 |

1. Low scenario relates only to NSW funded purchases; High relates to NSW and AWGF funded purchases

Source: BDA Group 2006. NB: price effect is the assumed price increase as a result of government purchase, economic costs are the costs borne by irrigation industry.

The direct cost to irrigation in the Gwydir will be between $8.3 million and $25.8 million. Cost estimates make no allowance for long term production sustainability. The regional economic cost is discussed but not quantified for the Gwydir. BDA Group points to general equilibrium models prepared by the Productivity Commission (Peterson *et al* 2004) and the Centre for International Economics (CIE 2004) which conclude that direct costs to irrigation will be partially offset by growth in dryland cereal production. A multiplier of direct cost to regional economic impact of 1.75 is identified.

### *Lessons from the Literature*

The following table summarises recent economic cost estimates of a common volumetric basis.

**Table 5.12 Comparison of Gwydir Studies - Economic Costs from Water Allocation Reduction**

| Author/Year | Allocation Reduction Modelled (GL) | Reduction in Irrigated Agriculture Value Added ($/ML) | Regional Multiplier – direct VA to Regional VA (1:x) | Comments |
|---|---|---|---|---|
| Wolfenden *et al* 2001 | 45 | 148 | 3 | Study prepared for the 11th Australian Cotton Conference |
| ACIL 2002 | 7<br>17 | 100<br>159 | 2<br>2 | 'Normal' year estimate<br>1-in-50 years |
| BDA Group 2006 | 3-9 | $2,732 | 1.75 | Other valleys examined had much lower $/ML estimates. High estimates relative to other studies may reflect reduced scope for 'low cost' efficiency gains |

Source: AgEconPlus analysis
NB: No attempt has been made to reconcile study differences and the scale of impacts modelled and the base case used are different in each study presented.

The iCAM model appears to be the most suitable tool for future policy analysis. It is comprehensive, purpose built and prepared by a neutral party (ANU) without a vested interest in the process.

# 6. Other Primary Industries - Forestry and Mining

Target data for this and subsequent sectors included:

- Gross Value
- Employment
- Additional Water to Gwydir Wetlands – Impact on this Activity
- Trends in this Activity
- Drought Impact (where available)
- Validity of Data Provided

Unless otherwise indicated these data were sourced from ABS. LGA coverage varies between some data sets, especially over time, and where relevant this is noted by the consultants.

## Forestry

Table 6.1 provides forestry locations by LGA for 1996. The NSW forestry reform process has resulted in the rationalisation of forestry in this region since 1996.

**Table 6.1: Forestry Locations—1996**

| Locns of Industry Class (noi) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Log Sawmilling | 1 | 2 | | 1 | 4 | 243 |
| Wood Chipping | | | | | | 14 |
| Timber Resawing and Dressing | | | | | | 40 |
| Plywood and Veneer Manufacturing | | | | | | 15 |
| Fabricated Wood Manufacturing | | | | | | 27 |
| Wooden Structural Component Mfg | 1 | | | | 1 | 788 |
| Wood Product Manufacturing n.e.c. | | | 1 | | 1 | 360 |
| Pulp, Paper and Paperboard Mfg | | | | | | 50 |
| Solid Paperboard Container Mfg | | | | | | 15 |
| Corrugated Paperboard Container Mfg | | | | | | 18 |
| Paper Bag and Sack Manufacturing | | | | | | 13 |
| Paper Product Manufacturing n.e.c. | | | | | | 47 |
| *SubTotal* | *2* | *2* | *1* | *1* | *6* | *1630* |
| Paper Stationery Manufacturing | | | | | | 102 |
| Printing | 1 | | | | 1 | 1272 |
| Services to Printing | | | 1 | | 1 | 403 |
| Newspaper Printing or Publishing | 1 | 1 | 1 | | 3 | 372 |
| Other Periodical Publishing | | | | | | 254 |
| Book and Other Publishing | | | | | | 184 |
| Recorded Media Mfg and Publishing | | | | | | 74 |
| *SubTotal* | *2* | *1* | *2* | | *5* | *2661* |

Source: ABS via EPA/DEC spreadsheet (A12 worksheet in Gwydir.xls)

The Gwydir forestry sector:

- Is native timber dependent i.e. hardwood including ironbark and softwood including cypress pine.
- Harvest and milling is focussed in the eastern portion of the catchment, which is more highly forested.
- The trend, post forest reform and lower resource availability is for contraction.
- The industry is not impacted to any extent by drought
- Additional water to the Gwydir wetlands will not impact on forestry in the region.

## Mining

Mining in the Gwydir is largely confined to sand and gravel extraction for local use and small-scale gem stone (sapphire and diamond) and tin mining operations.

**Table 6.2: Mining Locations—1996**

| Locns of Mining Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Black Coal Mining | | | | | | 151 |
| Brown Coal Mining | | | | | | 2 |
| Oil and Gas Extraction | | | | | | 2 |
| Iron Ore Mining | | | | | | 1 |
| Bauxite Mining | | | | | | |
| Copper Ore Mining | | | | | | 7 |
| Gold Ore Mining | | | | | | 18 |
| Mineral Sand Mining | | | | | | 6 |
| Nickel Ore Mining | | | | | | |
| Silver-Lead-Zinc Ore Mining | | | | | | 6 |
| Metal Ore Mining | | | | | | 3 |
| **Gravel and Sand Quarrying** | 1 | | 1 | | 2 | 139 |
| Construction Material Mining | | | | | | 178 |
| Mining | | | | | | 54 |
| Petroleum Exploration (Own Account) | | | | | | 20 |
| Petroleum Exploration Services | | | | | | 3 |
| Mineral Exploration (Own Account) | | | | | | 86 |
| Mineral Exploration Services | | | | | | 22 |
| **Other Mining Services** | | 1 | | | 1 | 106 |
| *SubTotal* | *1* | *1* | *1* | *0* | ***3*** | *804* |

Source: ABS via EPA/DEC spreadsheet (A9 worksheet in Gwydir.xls)

The Department of Mineral Resources NSW, Mineral Projects in NSW Map (Department of Mineral Resources 2003), identifies the following mineral projects in the Gwydir River Catchment:

- Woods Reef – other metals
- Barraba – industrial minerals
- Doonba – industrial minerals
- Copeton – gem stones
- Conrad – other metals
- Eaglehawk – gem stones
- Bingara – gem stones

The Gwydir mining sector has:

- A local quarrying, gem stone and tin mining focus.
- Employment in this sector has been trending down. In 2001 there were 25 persons employed (Table 14.1 of this report). It is not known whether the mid 2000s mining 'boom' has had a positively impact employment. Given that Gwydir mining is focused on gem stones and local quarrying needs, a continuation of current low numbers is likely.
- The industry may have experienced some limits on processing capacity associated with water shortages during drought. Higher security licenses, ensuring water supply, may have limited this impact.
- Additional water to the Gwydir wetlands will not impact on mining in the region.

# 7. Agricultural Service and Processing Industries

**Table 7.1: Food Processing Industry Locations —1996**

| Locations of Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Food, Beverage and Tobacco Mfg Subdiv | | | | | | 98 |
| Meat and Meat Product Mfg Group (no) | 1 | | | | 1 | 58 |
| Dairy Product Manufacturing Group (no) | | | | | | 53 |
| Fruit and Vegetable Processing Group (no) | | | | | | 27 |
| Flour Mill and Cereal Food Mfg Group (no) | | | | | | 18 |
| Bakery Product Manufacturing Group (no) | | | | | | 28 |
| Other Food Manufacturing Group (no) | | | | | | 65 |
| Beverage and Malt Mfg Group (no) | | | 1 | | 1 | 23 |
| Meat Processing | | | | | | 28 |
| Poultry Processing | | | | | | 58 |
| Milk and Cream Processing | | | | 1 | 1 | 205 |
| Dairy Product Manufacturing n.e.c. | | | 1 | | 1 | 150 |
| Fruit and Vegetable Processing | | | | | | 15 |
| Flour Mill Product Manufacturing | | | | | | 8 |
| Cereal Food and Baking Mix Mfg | | | | | | 58 |
| Bread Manufacturing | | | | | | 22 |
| Cake and Pastry Manufacturing | | 1 | 1 | | 2 | 69 |
| Confectionery Manufacturing | | | | | | 178 |
| Prepared Animal and Bird Feed Mfg | | | 1 | | 1 | 45 |
| Food Manufacturing n.e.c. | | | | | | 9 |
| Soft Drink, Cordial and Syrup Mfg | | | | | | 84 |
| Wine Manufacturing | | | | | | 6 |
| *SubTotal* | *1* | *1* | *4* | *1* | *7* | *1307* |

Source: ABS via EPA/DEC spreadsheet (A10 worksheet in Gwydir.xls)

**Table 7.2: Fibre and Textile Industry Locations —1996**

| Locns of Industries Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Wool Scouring | | | | | | 4 |
| Synthetic Fibre Textile Manufacturing | | | | | | 18 |
| Cotton Textile Manufacturing | | | | | | 28 |
| Wool Textile Manufacturing | | | | | | 9 |
| Textile Finishing | | | | | | 36 |
| *Made-Up Textile Product Manufacturing* | | | *1* | *1* | *2* | *265* |
| Textile Floor Covering Manufacturing | | | | | | 10 |
| Rope, Cordage and Twine Manufacturing | | | | | | 6 |
| Textile Product Manufacturing n.e.c. | | | | | | 66 |
| Hosiery Manufacturing | | | | | | 5 |
| Cardigan and Pullover Manufacturing | | | | | | 23 |
| Knitting Mill Product Manufacturing n.e.c. | | | | | | 23 |
| Men's and Boys' Wear Manufacturing | | | | | | 123 |
| *Women's and Girls' Wear Manufacturing* | | | *1* | | *1* | *636* |
| Sleepwear, Underwear &Infant Clothing | | | | | | 44 |
| Clothing Manufacturing n.e.c. | | | | | | 683 |
| Footwear Manufacturing | | | | | | 61 |
| Leather Tanning and Fur Dressing | | | | | | 35 |
| Leather and Leather Substitute Product | | | | 1 | 1 | 50 |
| *SubTotal* | | | *2* | *2* | | *2125* |

Source: ABS via EPA/DEC spreadsheet (A11 worksheet in Gwydir.xls)

Agricultural service and processing industries in the Gwydir include:

- Agricultural merchandising (eg chemical supplies, fencing materials, property sales, etc). This sector is directly dependent on agricultural production and profits and will be impacted by drought and additional water to the Gwydir wetlands.
- Professional services (Tables 10.1 and 10.2) such as agricultural consultants, accountants and to a lesser extent legal services. Like agricultural merchandising these sectors will be impacted by drought and water reallocation. There is a direct linkages between agricultural incomes and expenditure on these service items.
- Regional processing operations (Table 7.1 and 7.2) include abattoirs, local soft drink manufacturers, milk processing, bakery products, seed cleaning, limited textile manufacturing and cotton ginning. Again these industries are directly dependent on water availability and agricultural production and incomes.
- Cotton ginning dominates this sector in the Gwydir River catchment. Cotton ginning directly employs 25 people per gin during the season and there are 9 gins in the valley (Chapter 5).
- Separate financial and employment statistics for these sectors for Gwydir LGAs were not available from published sources.

# 8. Manufacturing and Other Secondary Industries

**Table 8.1: Manufacturing Locations by Type —1996**

| Manufacturing Industry Class | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Fertiliser Manufacturing | | | 1 | | 1 |
| Glass and Glass Product Manufacturing | | | | 1 | 1 |
| Concrete Slurry Manufacturing | | | 1 | 2 | 3 |
| Prefabricated Building Manufacturing n.e.c. | | | | 1 | 1 |
| Wooden Furniture and Upholstered Seat Mfg | | | 2 | 1 | 3 |
| Manufacturing n.e.c. | | | 1 | 1 | 2 |
| Iron and Steel Casting and Forging | | | | 1 | 1 |
| Basic Non-Ferrous Metal Manufacturing n.e.c. | | | 1 | 1 | 2 |
| Structural Steel Fabricating | | | 1 | 1 | 2 |
| Architectural Aluminium Product Mfg | | | 1 | 1 | 2 |
| Fabricated Metal Product Mfg n.e.c. | 1 | 1 | 5 | | 7 |
| Agricultural Machinery Manufacturing | | | 2 | | 2 |
| Machine Tool and Part Manufacturing | | 1 | 1 | | 2 |
| Lifting and Material Handling Equipment Mfg | | 1 | 1 | | 2 |
| Pump and Compressor Manufacturing | | 1 | | | 1 |

Source: ABS via EPA/DEC spreadsheet (A11 to A16 worksheet in Gwydir.xls)
NB: one location may produce multiple types of manufactured goods

**Table 8.2: Manufacturing Locations, employment Wages, Salaries and Turnover — 1996**

| LGA | Total Locations Operating at the End of June (no.) | Employment at end of June (no) | Wages and Salaries ($'000) | Turnover ($'000) |
|---|---|---|---|---|
| Armidale Dumaresq (A) | 41 | 218 | 5,477 | 20,450 |
| Guyra (A) | 9 | 58 | - | - |
| Gwydir (A) | 9 | 34 | 110 | 516 |
| Inverell (A) | 24 | - | - | - |
| Moree Plains (A) | 28 | 215 | 5,404 | 31,287 |
| Narrabri (A) | 27 | 225 | 6,274 | 25,334 |
| Uralla (A) | 10 | 41 | 733 | 3,599 |
| Walgett (A) | 7 | 20 | 262 | 1,149 |
| Total | 155 | 811 | 18,260 | 82,335 |

Source: Cat. No. 1304.1 New South Wales Regional Statistics 1999

Manufacturing in the Gwydir River valley has:

- A local fabrication focus including sheet metal works, agricultural machinery engineering, machine tools, concreting, etc (Table 8.1).
- In 1996 the sector had 155 locations, employed 811 persons and turned over $82 million (Table 8.2).
- The sector is expected to be less impacted than agricultural services/processing by drought and additional water to the Gwydir wetlands. It draws revenues from sectors other than agriculture and is unlikely to require river flows as an input into production.

## 9. Construction

**Table 9.1: Construction of New Dwellings—1997-98**

| LGA | Houses | Other Residential | Total |
|---|---|---|---|
| Armidale Dumaresq (A) | 47 | 3 | 50 |
| Guyra (A) | 12 | 0 | 12 |
| Gwydir (A) | 8 | 0 | 8 |
| Inverell (A) | 34 | 2 | 36 |
| Moree Plains (A) | 35 | 11 | 46 |
| Narrabri (A) | 44 | 11 | 55 |
| Uralla (A) | 20 | 0 | 20 |
| Walgett (A) | 19 | 9 | 28 |
| Total | 219 | 36 | 255 |

Source: Cat. No. 1368.1 New South Wales Regional Statistics

**Table 9.2: Construction of New Dwellings as a % of State Average—2005-06**

| LGA | Houses | Other Residential | Total | Construction of New Dwellings as a % of the State Average |
|---|---|---|---|---|
| Armidale Dumaresq (A) | 75 | 117 | 192 | 89 |
| Guyra (A) | 11 | 0 | 11 | 5 |
| Gwydir (A) | 21 | 0 | 21 | 10 |
| Inverell (A) | 54 | 19 | 73 | 34 |
| Moree Plains (A) | 37 | 4 | 41 | 41 |
| Narrabri (A) | 33 | 0 | 33 | 15 |
| Uralla (A) | 18 | 4 | 22 | 10 |
| Walgett (A) | 9 | 0 | 9 | 4 |
| Total | 258 | 144 | 402 | |

Source: Cat. No. 1368.1 New South Wales Regional Statistics

**Table 9.3: Construction Business Locations —1996**

| Locations Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| House Construction | 3 | 7 | 14 | 8 | 32 |
| Residential Bldg Construction n.e.c. | 1 | | 2 | | 3 |
| Non-Residential Bldg Construction | | | | 1 | 1 |
| Road and Bridge Construction | | 3 | 3 | | 6 |
| Non-Building Construction n.e.c. | | 1 | 4 | 1 | 6 |
| Site Preparation Services | 1 | 2 | 23 | 5 | 31 |
| Concreting Services | | | 3 | 3 | 6 |
| Structural Steel Erection Services | | | 1 | | 1 |
| Plumbing Services | | 2 | 7 | | 9 |
| Electrical Services | 2 | 1 | 8 | 2 | 13 |
| Air Con and Heating Services | | | 3 | | 3 |
| Plastering and Ceiling Services | | | 2 | | 2 |
| Carpentry Services | | | 1 | | 1 |
| Painting and Decorating Services | | | 5 | 3 | 8 |
| Landscaping Services | | | 2 | | 2 |
| Construction Services n.e.c. | | | | 1 | 1 |
| *SubTotal* | *7* | *16* | *78* | *24* | *125* |

Source: ABS via EPA/DEC spreadsheet (A25 worksheet in Gwydir.xls)

Notes on the Gwydir River catchment construction sector include:

- Armidale Dumaresq, Moree Plains and Inverell all recorded healthy growth in dwelling construction in 2005/06.
- The total number of dwellings constructed in 2005/06 is 58% greater than in 1997/98.
- Employment in the construction sector is stable (Table 14.1 of this report).
- The sector is expected to be less impacted than agricultural services/processing by drought and additional water to the Gwydir wetlands. It draws revenues from sectors other than agriculture and is more dependent on general economic conditions.

# 10. Services, Transport, Wholesale and Retail Trade

## Professional services

**Table 10.1: Financial Services—1996**

| Locns of Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Central Bank | | | | | |
| Banks | 1 | 2 | 7 | 2 | 12 |
| Building Societies | | | | | |
| Credit Unions | | | 2 | | 2 |
| Money Market Dealers | | | | | |
| Deposit Taking Financiers n.e.c. | | | | | |
| Other Financiers | | | | | |
| Financial Asset Investors | | | 2 | | 2 |
| Life Insurance | | | | | |
| Superannuation Funds | | | | | |
| Health Insurance | | | 2 | | 2 |
| General Insurance | | | 4 | | 4 |
| Financial Asset Broking Services | | | | | |
| Services to Finance n.e.c. | | | 3 | 1 | 4 |
| Services to Insurance | | 1 | 5 | | 6 |
| *SubTotal* | *1* | *3* | *25* | *3* | *32* |

Source: ABS via EPA/DEC spreadsheet (A19 worksheet in Gwydir.xls)

Banking dominates the region's professional service offering.

**Table 10.2: Professional Services—1996**

| Locns of Services Ind Cl (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Accounting Services | | 2 | 1 | | 3 |
| Advertising Services | | | 6 | | 6 |
| Architectural Services | 3 | | 7 | 1 | 11 |
| Business Administrative Services | | | | 1 | 1 |
| Business Management Services | | | 1 | | 1 |
| Cleaning Services | | | 5 | | 5 |
| Commercial Property Developers | | | | 2 | 2 |
| Commercial Art and Display Services | | 1 | 1 | | 2 |
| Computer Consultancy Services | | | 3 | 1 | 4 |
| Computer Maintenance Services | | | 1 | | 1 |
| Consulting Engineering Services | 1 | | 2 | 1 | 4 |
| Data Processing Services | | | 1 | 1 | 2 |
| Employment Placement Services | | 1 | 1 | 1 | 3 |
| Information Storage and Retrieval Services | 1 | | 5 | 1 | 7 |
| Legal Services | 1 | 2 | 8 | 4 | 15 |
| Non-Financial Asset Investors | | 1 | | | 1 |
| Other Transport Equipment Leasing | | | 3 | | 3 |
| Pest Control Services | | 11 | 11 | 3 | 25 |
| Residential Property Operators | | 2 | 7 | 3 | 12 |
| Scientific Research | | 1 | 1 | 2 | 4 |
| Security Services (Except Police) | | 1 | 2 | | 3 |
| Secretarial Services | | 1 | 6 | 3 | 10 |
| *SubTotal* | *6* | *23* | *72* | *24* | *125* |

Source: ABS via EPA/DEC spreadsheet (A20 worksheet in Gwydir.xls)

Pest control and legal services are well represented in the catchment.

**Table 10.3: Other Services—1996**

| Locns Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Video Hire Outlets | | | 2 | | 2 |
| Personal and Hhold Goods Hiring n.e.c. | | | | 1 | 1 |
| Laundries and Dry-Cleaners | | | 4 | | 4 |
| Photographic Film Processing | | | 3 | | 3 |
| Photographic Studios | | | 1 | 1 | 2 |
| Funeral Directors, Crematoria and Cemeteries | | | 1 | | 1 |
| Gardening Services | | | 1 | 1 | 2 |
| Hairdressing and Beauty Salons | | 1 | 13 | 1 | 15 |
| Religious Organisations | 5 | 5 | 13 | 8 | 31 |
| Business and Professional Associations | | | 1 | | 1 |
| Interest Groups n.e.c. | | 1 | 4 | | 5 |
| Police Services | 1 | 2 | 7 | 2 | 12 |
| Fire Brigade Services | 1 | 1 | 2 | 1 | 5 |
| Waste Disposal Services | | 1 | 1 | | 2 |
| Private Households Employing Staff | | | 1 | | 1 |
| *SubTotal* | *7* | *11* | *54* | *15* | *87* |

Source: ABS via EPA/DEC spreadsheet (A21 worksheet in Gwydir.xls)

**Table 10.4: Transport Services—1996**

| Locns Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Road Freight Transport | 6 | 1 | 34 | 7 | 48 |
| Long Distance Bus Transport | | | 2 | 1 | 3 |
| Short Distance Bus Transport | | 2 | 9 | 3 | 14 |
| Taxi and Other Road Passenger Transport | | | 1 | 1 | 2 |
| Rail Transport | | | 2 | | 2 |
| Non-Scheduled Air and Space Transport | | | 1 | | 1 |
| Services to Road Transport n.e.c. | 2 | | | | 2 |
| Travel Agency Services | | | 2 | | 2 |
| Road Freight Forwarding | | | 3 | | 3 |
| Services to Transport n.e.c. | | | 1 | | 1 |
| Grain Storage | | | 5 | | 5 |
| Storage n.e.c. | | 1 | 5 | | 6 |
| *SubTotal* | *8* | *4* | *65* | *12* | *89* |

Source: ABS via EPA/DEC spreadsheet (A24 worksheet in Gwydir.xls)

Services in the Gwydir River catchment likely to be affected by drought and/or additional allocations to the Gwydir Wetlands are transport services, especially:

- Long distance road freight;
- Rail transport;
- Services to road transport and road freight forwarding; and
- Grain storage.

These activities are directly dependent on the volume and value of agricultural commodities produced in the Gwydir. Financial services, professional services and other services are able to draw on other sectors of the economy for their revenue base and are therefore less affected by irrigation water availability.

## Wholesale

**Table 10.5: Wholesale Services—1996**

| Locns Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Wool Wholesaling | | 1 | 1 | | 2 |
| Cereal Grain Wholesaling | | | 1 | | 1 |
| Farm Produce &Supplies Wholesaling n.e.c. | 2 | 7 | 25 | 2 | 36 |
| Petroleum Product Wholesaling | 2 | | 11 | 1 | 14 |
| Metal and Mineral Wholesaling | | | 3 | | 3 |
| Chemical Wholesaling | | | 1 | | 1 |
| Timber Wholesaling | | | 1 | | 1 |
| Building Supplies Wholesaling n.e.c. | | 1 | 3 | | 4 |
| Farm and Construction Machinery | | 1 | 15 | 2 | 18 |
| Computer Wholesaling | | | 1 | | 1 |
| Business Machine Wholesaling n.e.c. | | | 2 | | 2 |
| Electrical & Electronic Equipment Wholesaling nec | | | 4 | | 4 |
| Machinery & Equipment Wholesaling nec | | | 4 | | 4 |
| Motor Vehicle New Part Dealing | | | 5 | | 5 |
| Motor Vehicle Dismantling &Used Parts | | 1 | 1 | 1 | 3 |
| Grocery Wholesaling n.e.c. | | | 2 | | 2 |
| Textile Product Wholesaling | 1 | | 1 | | 2 |
| Household Good Wholesaling n.e.c. | | | 1 | | 1 |
| Jewellery and Watch Wholesaling | | | 1 | | 1 |
| Wholesaling n.e.c. | | | 1 | | 1 |
| *SubTotal* | 5 | 11 | 84 | 6 | 106 |

Source: ABS via EPA/DEC spreadsheet (A20 worksheet in Gwydir.xls)

A review of wholesaling operations identified in the above ABS table shows that a large number of businesses in this sector will be affected by drought and/or additional allocations to the Gwydir Wetlands, i.e.:

- Farm produce and supplies wholesaling 36 of 106 locations;
- Farm and construction machinery wholesaling 18 of 106 locations; and
- Cereal grain, farm produce, petroleum (supplying agricultural machinery), chemicals (cropping inputs), farm machinery, motor vehicles and motor vehicle parts will also be affected.

These activities are directly dependent on the volume and value of irrigated agricultural commodities produced in the Gwydir.

## Retail

**Table 10.6: Retail Trade—1996**

| Locns of Retail Trd Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Supermarket and Grocery Stores | | 3 | 12 | 3 | 18 |
| Fresh Meat, Fish and Poultry Retl | 1 | 2 | 4 | 5 | 12 |
| Fruit and Vegetable Retl | 1 | 1 | 3 | | 5 |
| Liquor Retl | | | 1 | 2 | 3 |
| Bread and Cake Retl | | 1 | 4 | 1 | 6 |
| Takeaway Food Retl | 3 | 2 | 13 | 4 | 22 |
| Milk Vending | 1 | | 1 | 1 | 3 |
| Specialised Food Retl n.e.c. | | | | | |
| Department Stores | 1 | | 1 | | 2 |
| Clothing Retl | 1 | 2 | 12 | 3 | 18 |
| Footwear Retl | | | 3 | | 3 |
| Fabric and Other Soft Good Retl | | 1 | 3 | | 4 |
| Furniture Retl | | | 2 | | 2 |
| Floor Covering Retl | | | | 1 | 1 |
| Domestic Hardware & Houseware | | | 6 | 2 | 8 |
| Domestic Appliance Retl | 1 | | 8 | | 9 |
| Recorded Music Retl | | | | | |
| Sport and Camping Equipment Retl | | | 4 | 1 | 5 |
| Toy and Game Retl | | | | | |
| Newspaper, Book and Stationery Retl | | 2 | 6 | 2 | 10 |
| Photographic Equipment Retl | | | | | |
| Marine Equipment Retl | | | | | |
| Pharmaceutical, Cosmetic&Toiletry | 1 | 1 | 7 | 2 | 11 |
| Antique and Used Good Retl | | | 3 | 1 | 4 |
| Garden Equipment Retl | | | | | |
| Flower Retl | 2 | 1 | 4 | | 7 |
| Watch and Jewellery Retl | | | 3 | | 3 |
| Retl n.e.c. | | 1 | 3 | | 4 |
| Electrical Repair | 1 | | | | 1 |
| Equipment Repair Services n.e.c. | | | 1 | | 1 |
| Car Retl | | 1 | 8 | 2 | 11 |
| Motor Cycle Dealing | | | | | |
| Trailer and Caravan Dealing | | | | | |
| Automotive Fuel Retailing | | 4 | 12 | 5 | 21 |
| Automotive Electrical Services | 1 | | 4 | | 5 |
| Smash Repairing | 1 | 4 | 4 | 1 | 10 |
| Tyre Retailing | | | 7 | 1 | 8 |
| Automotive Repair and Services n.e.c. | 3 | 2 | 15 | 4 | 24 |
| *SubTotal* | *18* | *28* | *154* | *41* | *241* |

Source: ABS via EPA/DEC spreadsheet (A23 worksheet in Gwydir.xls)

Retail trade draws from all parts of the Gwydir River catchment economy and is less dependent on agriculture than other sectors such as transport and wholesaling.

## 11. Tourism and Recreation Industries

In 1993/94 tourism in the Gwydir River catchment, defined as Bingara, Guyra, Moree Plains and Yallaroi generated $53 million and employed 590 FTE persons (Tourism New South Wales data in Hassall & Associates 1995). More recent data is shown in the tables below.

**Table 11.1: Hotels, Motels with Facilities—June 2002 and June 2006**

| LGA | Est'ments 2002 no. | Est'ments 2006 no. | Bed Spaces 2002 no. | Bed Spaces 2006 no. | Employ 2002 no. | Employ 2006 no. |
|---|---|---|---|---|---|---|
| Armidale Dumaresq (A) | 16 | 17 | 1,391 | 1,287 | 148 | 146 |
| Guyra (A) | 1 | 1 | - | - | - | - |
| Gwydir (A) | - | - | - | - | - | - |
| Inverell (A) | 6 | 5 | 338 | - | 67 | - |
| Moree Plains (A) | 12 | 13 | 1,209 | 1,378 | 90 | 84 |
| Narrabri (A) | 5 | 6 | 402 | 492 | 38 | 41 |
| Uralla (A) | 2 | 2 | - | - | - | - |
| Walgett | 6 | 6 | 446 | 478 | 69 | 48 |
| **Total** | **48** | **50** | **3,786** | **3,635** | **412** | **319** |

Source: Cat. No. 1362.1 and 1368.1 New South Wales Regional Statistics

There was a small positive increase in the number of hotels and motels with facilities in the Gwydir River catchment between 2002 and 2006. Missing data underestimates bed spaces and employment in this sector.

**Table 11.2: Tourist Accommodation—June 2006**

| Local Government Area | Establishments no. | Bed Spaces no. | Employment no. | Takings $'000 |
|---|---|---|---|---|
| Armidale Dumaresq (A) | 25 | 1,478 | 165 | 2,322 |
| Guyra (A) | 3 | 0 | 0 | 0 |
| Gwydir (A) | 3 | 0 | 0 | 0 |
| Inverell (A) | 9 | 231 | 17 | 175 |
| Moree Plains (A) | 20 | 1,493 | 95 | 1,473 |
| Narrabri (A) | 15 | 873 | 70 | 1,187 |
| Uralla (A) | 5 | 0 | 0 | 0 |
| Walgett | 9 | 478 | 48 | 475 |
| Total | **89** | **4,553** | **395** | **5,632** |

Source: Cat. No. 1368.1 New South Wales Regional Statistics
NB: tourist accommodation includes hotels, motels, caravan parks, holiday flats and visitor hostels

The partial nature of the ABS data set limits the worth of the 2006 tourist accommodation estimates provided. At a minimum there are 89 establishments, employing 395 persons and taking $5.6 million.

**Table 11.3: Total Visitors – Selected Gwydir LGAs 1996**

| LGA | 1996<br>no. |
|---|---|
| Armidale Dumaresq (A) | |
| Bingara (A) | 2,100 |
| Guyra (A) | 4,262 |
| Gwydir (A) | |
| Inverell (A) | |
| Moree Plains (A) | 15,517 |
| Narrabri (A) | |
| Uralla (A) | 5,876 |
| Walgett | |
| **Total** | **27,755** |

Source: ABS via EPA/DEC spreadsheet (A1 worksheet in Gwydir.xls)

**Table 11.4: Recreational Services – Locations 1996**

| Locations of Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Film and Video Production | | | | | | 1401 |
| Film and Video Distribution | | | | | | 63 |
| Motion Picture Exhibition | | | 1 | | 1 | 145 |
| Radio Services | | | 1 | | 1 | 135 |
| Television Services | | | | | | 132 |
| Libraries | | 2 | 1 | 1 | 4 | 357 |
| Museums | | | 1 | | 1 | 119 |
| Zoological and Botanic Gardens | | | | | | 25 |
| Recreational Parks and Gardens | 1 | | | | 1 | 132 |
| Music and Theatre Productions | | | 1 | 2 | 3 | 465 |
| Creative Arts | | | | 1 | 1 | 469 |
| Sound Recording Studios | | | | | | 109 |
| Performing Arts Venues | | | | | | 50 |
| Services to the Arts n.e.c. | | | | | | 369 |
| Horse and Dog Racing | | | 1 | | 1 | 327 |
| Sports Grounds and Facilities n.e.c. | | 1 | | 2 | 3 | 1042 |
| Sports and Services to Sports n.e.c. | | | 1 | | 1 | 789 |
| Lotteries | | | | | | 23 |
| Casinos | | | | | | 1 |
| Gambling Services n.e.c. | 1 | 1 | 3 | | 5 | 944 |
| Other Recreation Services | 1 | | | | 1 | 1178 |
| *SubTotal* | 3 | 4 | 10 | 6 | 23 | 8275 |
| Accommodation | 4 | 5 | 16 | 3 | 28 | 3097 |
| Pubs, Taverns and Bars | 2 | 1 | 11 | 2 | 16 | 1701 |
| Cafes and Restaurants | 3 | 4 | 12 | 3 | 22 | 7412 |
| Clubs (Hospitality) | 2 | 3 | 8 | 2 | 15 | 1563 |
| *SubTotal* | 11 | 13 | 47 | 10 | 81 | 13773 |

Source: ABS via DEC spreadsheet (A18 worksheet in Gwydir.xls)

Recreational assets include (CEEWPR 2000):

- Copeton Dam near Inverell, which provides water-based activities such as swimming, sailing, water skiing and sailing. The landscape setting of the surrounding park is attractive and within easy distance of surrounding sapphire, diamond and tin mining areas.
- Moree, which provides a range of community and cultural facilities including an art gallery, libraries, spa baths, parks and numerous clubs.
- River based fishing.
- Bird watching – particularly in natural wetlands such as Gingham Watercourse.
- Camping.
- Workshops and demonstrations of cultural heritage conducted by local Aboriginal people.

Recreation and tourism would have suffered under drought conditions. People are less inclined to take holidays in the inland during a drought and residents are more inclined to visit coastal areas for a break.

Recreation and tourism would be a positive beneficiary of additional water allocation to the Wetlands. Positive outcomes would be possible for river based fishing, bird watching and camping with additional river flows.

## 12. Government Industries and Utilities

Government industries include local government services, education, health and policing.  Utilities include electricity supply, water supply, sewerage and drainage. Target data for this section included sites/locations, employment and trends.  Once again the data has been sourced from ABS publications unless otherwise stated.

Table 12.1 shows locations of government administration – central, state and local along with number of utility locations for electricity, gas, water and sewerage/drainage.

**Table 12.1: Government Industry and Utility Locations– 1996**

| Locns of Services Class (no) | Bingara | Guyra | Moree Plains | Uralla | Catch total |
|---|---|---|---|---|---|
| Central Gov Administration | | 1 | 3 | | 4 |
| State Gov Administration | 1 | | 2 | | 3 |
| Local Gov Administration | 2 | 1 | 4 | 3 | 10 |
| Justice | | | 3 | | 3 |
| Foreign Gov Representation | | | | | |
| Defence | | | | | |
| *SubTotal* | *3* | *2* | *12* | *3* | *20* |
| Postal Services | 1 | 3 | 3 | 3 | 10 |
| Courier Services | | | 1 | 1 | 2 |
| Telecommunication Services | | | 2 | 1 | 3 |
| *SubTotal* | *1* | *3* | *6* | *5* | *15* |
| Electricity Supply | 1 | 1 | 3 | 1 | 6 |
| Gas Supply | | | | | |
| Water Supply | 2 | 1 | 5 | 2 | 10 |
| Sewerage and Drainage Services | 1 | 1 | 1 | 1 | 4 |
| *SubTotal* | *4* | *3* | *9* | *4* | *20* |

Source: ABS via EPA/DEC spreadsheet (A17 worksheet in Gwydir.xls)

Local government revenues are shown in Table 12.2.

**Table 12.2: Local Council Revenues, Expenses and Borrowing ($'000) – 2002-03**

| LGA | Operating Revenues | Operating Expenses | Borrowings |
|---|---|---|---|
| Armidale-Dumaresq | 28,281 | 27,727 | - 8,128 |
| Bingara | 5,897 | 5,285 | - 1,626 |
| Inverell | 22,911 | 21,331 | - 4,876 |
| Guyra | 9,366 | 8,699 | - 3,380 |
| Uralla | 10,103 | 9,659 | - 3,084 |
| Moree Plains | 31,036 | 29,591 | 3,424 |
| Narrabri | 21,062 | 21,297 | - 2,178 |
| Walgett | 16,903 | 15,107 | - 5,342 |

Source: Cat. No. 1362.1 2004 New South Wales Regional Statistics

In terms of operating revenues, Moree Plains is the largest LGA in the Gwydir River catchment with operating revenues of more than $31 million and no debt.  Only small parts of Armidale-Dumaresq and Inverell are within the catchment boundaries.

## Health

**Table 12.3: Health Locations– 1996**

| Locns Industry Class (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Hospitals | 1 | 2 | 2 | | 5 |
| Psychiatric Hospitals | | | | | |
| Nursing Homes | | | | | |
| General Practice Med Ser | 1 | 3 | 13 | 2 | 19 |
| Specialist Medical Services | | | 1 | | 1 |
| Dental Services | | | 5 | 1 | 6 |
| Pathology Services | | | | | |
| Optometry & Optical Dispensing | | | 2 | | 2 |
| Ambulance Services | 1 | 1 | 2 | | 4 |
| Community Health Centres | | 1 | 5 | 2 | 8 |
| Physiotherapy Services | | | 1 | | 1 |
| Chiropractic Services | | | 1 | | 1 |
| Health Services n.e.c. | | | | 1 | 1 |
| Veterinary Services | 1 | 1 | 3 | 1 | 6 |
| Child Care Services | | | 3 | 2 | 5 |
| Accommodation for the Aged | 1 | 1 | 1 | | 3 |
| Residential Care Ser n.e.c. | | | 2 | 1 | 3 |
| Non-Residential Care Ser n.e.c. | 3 | | 13 | 1 | 17 |
| SubTotal | 8 | 9 | 54 | 11 | 82 |

Source: ABS via EPA/DEC spreadsheet (A26 worksheet in Gwydir.xls)

Government administration, education, health and community services account for 34% of service sector employment in the Gwydir River catchment (see Table 14.2 below).

## Schools

Education attendance for the Gwydir River catchment is detailed in the table below.

**Table 12.4: Persons in School– 1996**

| Educational Attendance (persons) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot |
|---|---|---|---|---|---|
| Psns In Pre School | 34 | 53 | 340 | 102 | 529 |
| Psns In Government Infant/Primary Schools | 169 | 390 | 1301 | 544 | 2404 |
| Psns In Non Government Infant/Primary Schools | 26 | 70 | 411 | 179 | 686 |
| Psns in Government Secondary Schools | 101 | 226 | 782 | 409 | 1518 |
| Psns In Non Government Secondary Schools | 3 | 73 | 33 | 135 | 244 |
| Psns Full-Time In TAFE Colleges | 3 | 6 | 70 | 18 | 97 |
| Psns Part-Time In TAFE Colleges | 17 | 39 | 269 | 101 | 426 |
| Psns F/T-P/T Not Stated In TAFE Colleges | | | 5 | | 5 |
| Psns Full-Time In CAE/Universities | | 15 | 13 | 95 | 123 |
| Psns Part-Time In CAE/Universities | 9 | 31 | 138 | 93 | 271 |
| Psns Full-Time In Other Educational Institutions | 3 | 3 | 3 | 6 | 15 |
| Psns Part-Time In Other Educational Institutions | | 7 | 24 | 9 | 40 |
| Psns F/T-P/T Not Stated Other Ed. Institutions | | | 3 | | 3 |
| Psns Not Attending Educational Institutions | 1614 | 3146 | 11242 | 3971 | 19973 |
| Psns Not Stated To Attending Ed. Institution | 101 | 192 | 852 | 198 | 1343 |
| Total Persons Class. By Attending Ed Institution | 2099 | 4260 | 15516 | 5870 | 27745 |
| *Locns of Edu Ind Class (no)* | | | | | |
| Preschool Education | 1 | | 8 | 2 | 11 |
| Primary Education | 1 | 6 | 13 | 4 | 24 |
| Secondary Education | | | 2 | | 2 |
| Combined Primary and Secondary Education | 1 | 1 | 1 | 2 | 5 |
| Technical and Further Education | | | 2 | | 2 |
| Other Education | 1 | 2 | 3 | 1 | 7 |
| *Sub Total* | *4* | *9* | *29* | *9* | *51* |

Source: ABS via EPA/DEC spreadsheet (A27 worksheet in Gwydir.xls)

**Table 12.5: Persons in School– 1991, 1996 and 2001**

| | 1991 | 1996 | 2001 |
|---|---|---|---|
| Bingara | 2,149 | 2,099 | 2,059 |
| Guyra | 3,520 | 3,267 | 3,204 |
| Moree Plains | 12,481 | 11,655 | 11,860 |
| Uralla | 4,322 | 4,411 | 4,424 |
| Catchment Total | 22,472 | 21,432 | 21,547 |

Source: ABS Census Tables 2001

**Table 12.5 Persons in School – 1991, 1996, 2001 and 2006**

| | 1991 | 1996 | 2001 | 2006 |
|---|---|---|---|---|
| Gwydir | 1030 | 1281 | 909 | 803 |
| Guyra | 853 | 803 | 770 | 707 |
| Moree Plains | 2,720 | 2,536 | 2,480 | 2,065 |
| Uralla | 1,185 | 1286 | 1104 | 1027 |
| **Catchment Total** | **5,788** | **5,906** | **5,263** | **4,602** |

Source: ABS Census 2001 & 2006 Type of Educational Institution Attending Time Series

Almost half of the Gwydir's high school age children attend residential boarding schools outside the area. Many of these students do not return to the area to look for work. For these reasons, standards of education in the western part of the catchment and in Moree in particular are perceived as low (CEEWPR 2000)

## PART B: SOCIO-ECONOMIC VARIABLES AND TRENDS

## 13. Population Statistics

Data requested and provided included:

- Population (not requested)
- Age Profiles
- Net Migration
- Housing Tenure
- Skills and Education
- Ethnic Background

These data were sourced from the ABS unless otherwise stated.

### Population, Net Migration and Age Profile

**Table 13.1: Resident Population and average annual growth rates—2000 to 2005**

| Local Government Area | 2000 no. | 2001 no. | 2002 no. | 2003 no. | 2004 no. | 2005 no. | 00–05 % |
|---|---|---|---|---|---|---|---|
| Armidale Dumaresq (A) | 24,944 | 24,807 | 24,780 | 24,657 | 24,558 | 24,611 | –0.3 |
| Guyra (A) | 4,430 | 4,475 | 4,484 | 4,453 | 4,434 | 4,460 | 0.1 |
| Gwydir (A) | 5,768 | 5,760 | 5,700 | 5,634 | 5,563 | 5,530 | –0.8 |
| Inverell (A) | 15,596 | 15,754 | 15,812 | 15,768 | 15,705 | 15,794 | 0.3 |
| Moree Plains (A) | 15,905 | 16,233 | 16,227 | 16,141 | 16,002 | 15,936 | 0.0 |
| Narrabri (A) | 14,443 | 14,537 | 14,463 | 14,373 | 14,217 | 14,172 | –0.4 |
| Uralla (A) | 6,019 | 6,099 | 6,076 | 6,021 | 6,031 | 6,075 | 0.2 |
| Walgett | 8,446 | 8,328 | 8,281 | 8,201 | 8,083 | 8,031 | –1.0 |

Source: Cat. No. 1362.1 and 1368.1 New South Wales Regional Statistics
NB: Population data also available for 1992 to 97 GWYDIR.xls in DEC files for Bingara, Yallaroi, Guyra, Uralla and Moree Plains.

Across all LGAs partially or wholly within the Gwydir River catchment there was a net one percent loss in population i.e. a net migration out of the catchment between 2000 and 2005. During this time population fell from 95,551 to 94,609 people. State wide the population grew over this same period.

**Table 13.2: Age of Resident Population — 30 June 2005**

| Local Government Area | 0–14 years % | 15–24 years % | 25–64 years % | >65 years % | Total % |
|---|---|---|---|---|---|
| Armidale Dumaresq (A) | 19.2 | 21.8 | 47.0 | 12.0 | 100 |
| Guyra (A) | 22.1 | 10.6 | 51.0 | 16.4 | 100 |
| Gwydir (A) | 19.9 | 8.1 | 53.8 | 18.2 | 100 |
| Inverell (A) | 21.4 | 12.1 | 49.0 | 17.5 | 100 |
| Moree Plains (A) | 23.6 | 12.5 | 54.4 | 9.6 | 100 |
| Narrabri (A) | 21.2 | 11.7 | 52.9 | 14.2 | 100 |
| Uralla (A) | 21.4 | 11.7 | 53.5 | 13.5 | 100 |
| Walgett (A) | 20.0 | 10.4 | 57.8 | 11.9 | 100 |
| **NSW** | **19.5** | **13.6** | **53.3** | **13.7** | **100** |

Source: Cat. No. 1368.1 New South Wales Regional Statistics

As at 30 June 2005 the age of residents in the Gwydir River was broadly consistent with that of NSW as a whole. However the shires of Moree Plains and Guyra have a higher than average young people population (0-14 years) and Guyra, Gwydir and Inverell have a higher older person population (>65 years).

## Housing Tenure

**Table 13.3: Tenure Type of Occupied Private Dwelling—2002-03**

| Tenure Type | North West SD | Representative Sydney (Ryde) | NSW |
|---|---|---|---|
| Fully Owned | 42.6 | 41.7 | 39.0 |
| Being Purchased | 20.3 | 20.2 | 23.7 |
| Rented | 26.6 | 31.2 | 29.0 |
| Other | 10.5 | 6.9 | 8.3 |

Source: Cat. No. 1362.1 Regional Statistics New South Wales 2004

Housing tenure in the North West Statistical Division, which includes the Gwydir River catchment, is consistent with suburban Sydney (Ryde) and the rest of NSW.

## Ethnic Background

**Table 13.4: Country of Birth —2006**

| | Australia | Main English speaking countries (d) | Mainly non-English speaking countries | Born Elsewhere | Not stated | Total |
|---|---|---|---|---|---|---|
| Local Government Area | % | % | % | % | % | % |
| Armidale Dumaresq (A) | 84.5 | 4.3 | 3.9 | 1.6 | 5.8 | 100.0 |
| Guyra (A) | 90.3 | 3.2 | 0.5 | 0.2 | 5.7 | 100.0 |
| Gwydir (A) | 90.8 | 2.2 | 1.1 | 0.5 | 5.3 | 99.9 |
| Inverell (A) | 90.3 | 2.9 | 1.3 | 0.4 | 5.0 | 100.0 |
| Moree Plains (A) | 85.2 | 2.1 | 1.7 | 0.5 | 10.5 | 100.0 |
| Narrabri (A) | 89.7 | 2.1 | 1.2 | 0.5 | 6.5 | 100.0 |
| Uralla (A) | 88.8 | 4.0 | 2.1 | 0.7 | 4.4 | 100.0 |
| Walgett | 81.8 | 3.6 | 4.1 | 2.2 | 8.4 | 100.0 |
| **NSW** | **69.0** | **13.2** | **6.4** | **4.2** | **7.2** | **100.0** |

Source: ABS Census 2006 Country of Birth of Person by Sex.
NB: Yallaroi and Bingara combined provided Gwydir (A) LGA data.

The population of the Gwydir River Catchment has a much higher level of Australian born and English speaking background residents than the whole of NSW.

## Skills and Education

**Table 13.5: Education Attainment—May 2003**

| | North West SD | Murray-Murrumbidgee SR | Balance of NSW MSR | NSW |
|---|---|---|---|---|
| *Persons with non-school qualifications* | | | | |
| Postgraduate degree (%) | 0.6 | 0.7 | 1.1 | 2.8 |
| Graduate dip & grad cert | 2.6 | 1.7 | 1.9 | 2.3 |
| Bachelor degree | 8.3 | 9.5 | 8.1 | 13.9 |
| Advanced diploma and dip | 5.8 | 4.5 | 6.5 | 7.8 |
| Certificate III and IV | 17.7 | 17.6 | 17.9 | 14.5 |
| Certificate I and II | 8.4 | 9.3 | 7.9 | 7.0 |
| Certificate not defined | 2.5 | 1.2 | 2.0 | 1.9 |
| Level not determined | 1.6 | 0.5 | 1.3 | 1.1 |
| Total | 47.5 | 45.0 | 46.8 | 51.3 |
| *Persons without non-school qualifications* | | | | |
| Year 12 | 10.2 | 12.3 | 12.4 | 16.4 |
| Year 11 | 5.0 | 4.7 | 4.8 | 4.0 |
| Year 10 and below | 37.3 | 38.0 | 36.0 | 28.2 |
| Total | 52.5 | 55.0 | 53.2 | 48.7 |
| Total persons (15-64 years) | 283.6 | 184.1 | 1,505.3 | 4,373.9 |

Source: Cat. No. 1362.1 New South Wales Regional Statistics 2004
NB: table also available in EPA/DEC spreadsheet (A3 worksheet in Gwydir.xls) for selected catchments 1996, 1991 and 1986.

The North West SD (which includes the Gwydir River catchment) has fewer persons with higher level post secondary school qualifications (eg bachelor degree) than the state average but more lower level (certificate) qualifications.

**Table 13.6: Indigenous Children in Primary/Secondary Education —Govt Schools 2006**

| Local Government Area | Indigenous no. | Non-Indigenous no. | Indigenous status not stated no. | Total no. | Percentage % |
|---|---|---|---|---|---|
| Armidale Dumaresq (A) | 255 | 2,211 | 32 | 2,498 | 10% |
| Guyra (A) | 102 | 461 | 0 | 563 | 18% |
| Gwydir | 40 | 649 | 24 | 713 | 6% |
| Inverell (A) | 235 | 1,765 | 33 | 2,033 | 12% |
| Moree Plains (A) | 534 | 806 | 36 | 1,376 | 39% |
| Narrabri (A) | 274 | 1,307 | 29 | 1,610 | 17% |
| Uralla (A) | 74 | 637 | 10 | 721 | 10% |
| Walgett | 328 | 346 | 21 | 695 | 47% |
| **NSW** | **30,637** | **599,741** | **12,171** | **642,549** | **5%** |

Source: ABS Census 2006 Type of Educational Institution Attending by Indigenous Status

Compared with the average for NSW (5%), Gwydir River LGAs have a strong indigenous presence in the government school system. Half the students in Walgett and Moree Plains are indigenous children.

## 14. Labour Force Characteristics

### Employment and Unemployment for Indigenous and Non Indigenous Population

**Table 14.1: Change in Employment 'Gwydir River Valley—1991 to 2006**

| | 1991 | 1996 | 2001 | 2006 |
|---|---|---|---|---|
| Agriculture, Forestry and Fishing | 3,795 | 3,340 | 3,365 | 3,630 |
| Mining | 20 | 28 | 25 | 21 |
| Manufacturing | 717 | 556 | 639 | 622 |
| Electricity, Gas and Water Supply | 172 | 84 | 50 | 87 |
| Construction | 567 | 472 | 623 | 714 |
| Wholesale Trade | 574 | 548 | 536 | 371 |
| Retail Trade | 1,381 | 1,428 | 1,458 | 1,168 |
| Accommodation, Cafes and Restaurants | 450 | 481 | 500 | 579 |
| Transport and Storage | 324 | 300 | 366 | 443 |
| Communication Services | 192 | 205 | 142 | 117 |
| Finance and Insurance | 238 | 272 | 214 | 236 |
| Property and Business Services | 444 | 552 | 672 | 538 |
| Government Administration and Defence | 493 | 468 | 515 | 998 |
| Education | 906 | 940 | 888 | 1,074 |
| Health and Community Services | 661 | 848 | 880 | 1,050 |
| Cultural and Recreational Services | 107 | 181 | 121 | 86 |
| Personal and Other Services | 310 | 326 | 333 | 489 |
| Inadequately described/Not stated | 1,055 | 420 | 405 | 362 |
| Total | 12,406 | 11,449 | 11,732 | 12,581 |

Source: ABS Census for the LGAs of Bingara, Guyra, Moree Plains and Uralla

**Table 14.2: Employment by Sector – Northern Statistical Division and NSW—2005/06 (thousands of jobs)**

| | North-West NSW '000 | North-West NSW % | NSW '000 | NSW % |
|---|---|---|---|---|
| Agriculture, forestry and fishing | 41.0 | 17% | 97.0 | 3% |
| Mining | 5.0 | 2% | 20.3 | 1% |
| Manufacturing | 18.3 | 8% | 323.6 | 10% |
| Electricity, gas and water supply | 3.1 | 1% | 25.2 | 1% |
| Construction | 16.0 | 7% | 272.1 | 8% |
| Wholesale trade | 8.9 | 4% | 148.3 | 5% |
| Retail trade | 39.4 | 16% | 482.9 | 15% |
| Accommodation, cafes and restaurants | 14.3 | 6% | 168.2 | 5% |
| Transport and storage | 10.2 | 4% | 157.4 | 5% |
| Communication services | 2.8 | 1% | 65.6 | 2% |
| Finance and insurance | 4.7 | 2% | 166.6 | 5% |
| Property and business services | 16.5 | 7% | 413.1 | 13% |
| Government administration and defence | 10.2 | 4% | 133.8 | 4% |
| Education | 17.5 | 7% | 232.5 | 7% |
| Health and community services | 21.8 | 9% | 327.9 | 10% |
| Cultural and recreational services | 4.8 | 2% | 89.2 | 3% |
| Personal and other services | 8.8 | 4% | 131.8 | 4% |
| **Total** | **243.3** | **100%** | **3,255.5** | **100%** |

Source: Cat. No. 1368.1 New South Wales Regional Statistics

NB: North West NSW includes Northern, Far West-North Western, Central West Stat. Regions

Employment in North West NSW is strongly dominated by Agriculture, Forestry and Fishing relative to the whole of NSW even though it is remarkable how similar the North West Statistical Division is the NSW profile.

**Table 14.3: Labour Force Status—2005/06**

| Indicator | North-West NSW (%) | NSW (%) |
|---|---|---|
| Male Unemployment Rate | 5.8 | 5.5 |
| Female Unemployment Rate | 4.3 | 5.0 |
| Participation Rate | 63.7 | 62.9 |

The unemployment rate in North West NSW is consistent with the NSW average and the participation rate is slightly higher.

The North West unemployment rate has trended down over time:

**Table 14.4: North West Unemployment Rate Trend**

| August - | Unemployment Rate |
|---|---|
| 1997 | 8.6 |
| 1998 | 6.8 |
| | |
| 2002 | 6.9 |
| 2003 | 9.1 |
| | |
| 2005 | 5.1 |

Source: Cat. No. 1368.1 New South Wales Regional Statistics (various issues)

## Indigenous Unemployment

In 2000 the region's socio-economic data indicate a high rate of unemployment among some groups – particularly Aboriginal people – suggesting two things. First, young non-indigenous people are inclined or better equipped (in terms of education) to leave the area if they cannot find work. By way of contrast, young Aborigines tend not to leave the area and if they cannot find work, they remain unemployed. Clearly, the distribution of wealth could be improved if only mechanisms could be found to bring disadvantaged groups into the mainstream. Currently there are about 50 Aborigines employed directly in the Gwydir Valley cotton industry and this 'beginning' is likely to serve as a model for similar programs in other cotton growing areas (CEEWPR 2000).

In 2006 the ABC 7.30 Report reported that while 'the history of Aboriginal funding in Australia is littered with stories of misspending and poorly-targeted schemes. Not so is a privately-inspired Aboriginal Employment Strategy which had its birth in the cotton town of Moree in the north west of NSW. It was the idea of a cotton farmer who hoped creating jobs for Aborigines would break down their reliance on welfare, create social stability and end a long history of racial trouble in the town. It worked so well, the Aboriginal Employment Strategy spread to three other towns and has now opened its doors in Sydney. Last financial year alone, it found jobs for more than 500 Aboriginal people. Now, it's widening the net with another innovative plan. It's targeting Aboriginal kids in the last two years of high school, offering them part time traineeships while they complete their schooling so they'll have jobs to go to when they leave.

In addition, a Moree Place Manager has been appointed to coordinate all State government departments involved with improving the outcomes for local Aboriginal people.

# 15. Characteristics of Communities

Data requested and provided included:

- Resilience / Vulnerability to change
- Access to Services
- Household Income
- Social Security Payments as a Percentage of Household Income
- Other Indicators

These data were sourced from the ABS unless otherwise stated.

## Resilience / Vulnerability to Change – SEIFA Index Relative Disadvantage

Socio-Economic Indexes for Areas (SEIFA) indexes are scores that summarise a number of socio-economic variables that represent disadvantage in an area. SEIFA indexes for Gwydir River Catchment LGAs, the North West Statistical Division and other comparative statistical Divisions are summarised in the table.

**Table 15.1: SEIFA Index of Relative Disadvantage-1996**

| LGA/SD | Index of Relative Disadvantage |
|---|---|
| North West (SD) | 952 |
| Armidale Dumaresq (A) | 1039 |
| Bingara (A) | 930 |
| Guyra (A) | 917 |
| Inverell (A) | 957 |
| Moree Plains (A) | 946 |
| Narrabri (A) | 970 |
| Uralla (A) | 1004 |
| Walgett | 861 |
| Yallaroi (A) | 977 |
| Central West (SD) | 982 |
| Far West (SD) | 919 |
| South East (SD) | 1004 |
| NSW | 1007 |

Source: Cat. No. 1368.1 New South Wales Regional Statistics 1999

With the exception of Armidale Dumaresq and Uralla LGAs, other Gwydir LGAs are more disadvantaged than the NSW average. Walgett LGA in the far west of the Gwydir River catchment has the lowest SEIFA index.

CEEWPR 2000 note that 'While Moree is at the centre of a highly productive region and is generally seen as prosperous, there is concern about the level of equity and social cohesion in the community. Some sectors of the community have clearly not benefited from the economic growth of the region. One outcome has been the Aboriginal Employment Strategy.

### Resilience / Vulnerability to Change –ABS Index of Remoteness

Residents of the Gwydir River catchments LGAs typically have access to outer regional centres. Excluding Walgett at the western fringe of the catchment, Gwydir River LGAs have only a small proportion of their population is remote areas.

### Individual and Household Income

**Table 15.2: Individual Taxable Income – Gwydir and NSW—2003/04**

| Local Government Area | Non-taxable individuals no. | Taxable individuals no. | Taxable income $'000 | Mean taxable income $ | Net tax $'000 | Mean net tax $ |
|---|---|---|---|---|---|---|
| Armidale Dumaresq (A) | 2,606 | 9,819 | 375,248 | 38,217 | 84,912 | 8,648 |
| Bingara (A) | 314 | 687 | 22,579 | 32,865 | 4,457 | 6,487 |
| Guyra (A) | 613 | 1,568 | 53,459 | 34,094 | 10,959 | 6,989 |
| Inverell (A) | 1,961 | 5,700 | 194,074 | 34,048 | 39,312 | 6,897 |
| Moree Plains (A) | 1,760 | 5,708 | 227,508 | 39,858 | 53,393 | 9,354 |
| Narrabri (A) | 1,726 | 5,514 | 218,220 | 39,576 | 51,914 | 9,415 |
| Uralla (A) | 777 | 2,311 | 81,520 | 35,275 | 17,747 | 7,679 |
| Walgett | 1,055 | 2,077 | 73,002 | 35,148 | 15,538 | 7,481 |
| Yallaroi (A) | 482 | 1,154 | 39,842 | 34,526 | 8,237 | 7,137 |
| **NSW** | **695,552** | **2,907,300** | **133,657,669** | **45,973** | **35,020,412** | **12,046** |

Source: Cat. No. 1368.1 New South Wales Regional Statistics

Mean net taxable income in the LGAs that make up the Gwydir River catchment are lower than the NSW average.

**Table 15.3: Households Weekly Incomes 1996 – LGAs and NSW Total**

| Household with Income (no) | Bingara | Guyra | Moree Plains | Uralla | Ctch_tot | NSW_total |
|---|---|---|---|---|---|---|
| Neg/Nil income | 10 | 29 | 85 | 30 | 154 | 17,618 |
| $1-$119 | 0 | 29 | 61 | 31 | 121 | 16,043 |
| $120-$299 | 274 | 375 | 851 | 449 | 1,949 | 379,511 |
| SubTotal | 284 | 433 | 997 | 510 | 2,224 | 413,172 |
| % | 33 | 28 | 19 | 24 | 22 | 19 |
| $300-$499 | 230 | 352 | 935 | 445 | 1,962 | 333,422 |
| $500-$699 | 93 | 243 | 855 | 334 | 1,525 | 269,362 |
| $700-$999 | 74 | 186 | 775 | 309 | 1,344 | 321,765 |
| SubTotal | 397 | 781 | 2565 | 1088 | 4,853 | 924,549 |
| % | 46 | 50 | 48 | 51 | 49 | 43 |
| $1,000-$1,499 | 40 | 95 | 643 | 212 | 990 | 310,800 |
| $1,500-$1,999 | 11 | 17 | 187 | 60 | 275 | 124,683 |
| $2,000 or more | 6 | 29 | 184 | 44 | 263 | 132,049 |
| SubTotal | 57 | 141 | 1014 | 316 | 1,577 | 567,532 |
| % | 7 | 9 | 19 | 15 | 16 | 27 |
| Partial income stated | 89 | 147 | 591 | 160 | 987 | 177,279 |
| All incomes not stated | 27 | 51 | 222 | 44 | 344 | 57,339 |
| Total | 854 | 1553 | 5389 | 2118 | 9,914 | 2,139,871 |

Source: ABS Census of Population and Housing via EPA/DEC spreadsheet (A2 96 worksheet in Gwydir.xls). Data also available for 1991 and 1986

**Table 15.4: Households Weekly Incomes 2001 – Selected LGAs**

| | Bingara | Guyra | Moree Plains | Uralla | Catch_tot |
|---|---|---|---|---|---|
| Negative/Nil income | 5 | 17 | 76 | 18 | 116 |
| $1-$199 | 57 | 77 | 214 | 103 | 451 |
| $200-$299 | 85 | 131 | 329 | 193 | 738 |
| $300-$399 | 153 | 208 | 444 | 228 | 1,033 |
| $400-$499 | 99 | 137 | 363 | 200 | 799 |
| $500-$599 | 47 | 117 | 306 | 144 | 614 |
| $600-$699 | 65 | 118 | 358 | 161 | 702 |
| $700-$799 | 35 | 70 | 282 | 113 | 500 |
| $800-$999 | 54 | 161 | 554 | 215 | 984 |
| $1,000-$1,199 | 34 | 91 | 434 | 158 | 717 |
| $1,200-$1,499 | 32 | 85 | 452 | 135 | 704 |
| $1,500-$1,999 | 22 | 83 | 435 | 129 | 669 |
| $2,000 or more | 11 | 50 | 300 | 87 | 448 |
| Partial income stated(b) | 85 | 100 | 466 | 195 | 846 |
| All incomes not stated(c) | 42 | 89 | 259 | 61 | 451 |
| **Total** | **826** | **1,534** | **5,272** | **2,140** | **9,772** |

Source: ABS Census 2001

**Table 15.5: Households Weekly Incomes 2006 – Selected LGAs**

| Household with Income (no) | Gwydir | Guyra | Moree Plains | Uralla | Ctch tot | NSW total |
|---|---|---|---|---|---|---|
| Negative/Nil income | 51 | 25 | 78 | 35 | 513 | 28,841 |
| $1-$149 | 47 | 38 | 77 | 42 | 645 | 34,454 |
| $150-$249 | 147 | 99 | 237 | 119 | 2,188 | 121,575 |
| $250-$349 | 191 | 134 | 307 | 202 | 2,818 | 162,152 |
| $350-$499 | 241 | 130 | 217 | 152 | 2,132 | 120,360 |
| $500-$649 | 320 | 210 | 464 | 273 | 4,156 | 233,507 |
| $650-$799 | 135 | 106 | 346 | 150 | 2,241 | 139,260 |
| $800-$999 | 128 | 126 | 324 | 177 | 2,193 | 151,854 |
| $1,000-$1,199 | 223 | 187 | 535 | 248 | 3,573 | 231,702 |
| $1,200-$1,399 | 85 | 101 | 262 | 134 | 1,678 | 117,738 |
| $1,400-$1,699 | 84 | 70 | 323 | 122 | 1,799 | 166,833 |
| $1,700-$1,999 | 52 | 37 | 251 | 73 | 1,365 | 138,028 |
| $2,000-$2,499 | 53 | 38 | 227 | 85 | 1,207 | 140,563 |
| $2,500 -$2,999 | 45 | 24 | 143 | 62 | 850 | 140,184 |
| $3,000 or more | 32 | 19 | 134 | 28 | 625 | 139,990 |
| Partial income stated(c) | 165 | 116 | 493 | 190 | 2,748 | 193,199 |
| All incomes not stated(d) | 105 | 80 | 238 | 59 | 1,332 | 67,978 |
| **Total** | **2,104** | **1,540** | **4,656** | **2,151** | **32,063** | **2,328,218** |

Source: ABS Census 2006 Gross Household Income (Weekly) By Household Composition.

## Access to Services – Libraries

**Table 15.6: Circulation of Material in Libraries % of State Average—2004-05**

| LGA | Circulation of Material in Libraries as a % of the State Average |
|---|---|
| Armidale Dumaresq (A) | 78 |
| Guyra (A) | 5 |
| Gwydir (A) | 4 |
| Inverell (A) | 4 |
| Moree Plains (A) | 4 |
| Narrabri (A) | 2 |
| Uralla (A) | 2 |
| Walgett (A) | 4 |
| **NSW** | **100** |

Source: Cat. No. 1368.1 New South Wales Regional Statistics

Libraries are less frequently used in the Gwydir River catchment relative to other parts of the state. Only Armidale Dumaresq approaches the state average for library use.

## Other Indicators – Crime and Justice

**Table 15.7: Recorded criminal incident rates—Selected Indicators 2005 (a)**

| | Assault- Domestic violence related | Assault Non-Domestic violence related | Sexual assault | Break and enter - dwelling | Arson | Driving offences |
|---|---|---|---|---|---|---|
| LGA | rate | rate | rate | rate | rate | rate |
| Armidale Dumaresq (A) | 300.7 | 735.4 | 69.1 | 1,117.4 | 48.8 | 10,483.1 |
| Guyra (A) | 784.8 | 941.7 | 67.3 | 313.9 | 89.7 | 22,174.9 |
| Gwydir (A) | 235.1 | 578.7 | 126.6 | 415.9 | np | 4,810.1 |
| Inverell (A) | 702.8 | 930.7 | 126.6 | 709.1 | 25.3 | 5,369.1 |
| Moree Plains (A) | 1,317.8 | 1,901.4 | 182.0 | 1,650.4 | 213.4 | 14,947.3 |
| Narrabri (A) | 543.3 | 1,023.1 | 84.7 | 458.7 | 155.2 | 10,944.1 |
| Uralla (A) | 432.0 | 504.0 | – | 360.0 | np | 11,303.1 |
| Walgett (A) | 3,050.7 | 3,374.4 | 211.7 | 1,344.8 | 124.5 | 14,468.9 |
| **NSW** | **381.9** | **658.8** | **59.3** | **733.6** | **95.1** | **8,882.1** |

Source: Cat. No. 1368.1 New South Wales Regional Statistics
(a) Rate per 100,000 population. Based on 2005 preliminary Estimated Resident Population.
np = not published

For a number of the selected recorded criminal incident indicators Gwydir River Valley has higher levels of incidents per 100,000 head of population than the NSW average.

### Other Indicators – Single Parent Families

**Table 15.8: One Parent Families as a % of Total Families—2006**

| LGA | Percentage of One Parent Families with Dependent Children % |
|---|---|
| Armidale Dumaresq (A) | 11 |
| Guyra (A) | 9 |
| Gwydir (A) | 7 |
| Inverell (A) | 11 |
| Moree Plains (A) | 12 |
| Narrabri (A) | 10 |
| Uralla (A) | 8 |
| Walgett (A) | 14 |
| **NSW** | **9** |

Source: ABS Census 2006 Family Composition

One parent families with dependent children are most prevalent in Armidale Dumaresq. The reason for this higher rate is unclear.

## 16. Possible Future Developments (Socio-Demographic/Economic Activities)

The following section reviews available information about expected future developments.

### CEEWPR - A Strategic Plan for the Gwydir Valley

CEEWPR 2001 'strategic plan and risk management strategy for sustainable development of resources in the Gwydir valley' identified the need to build capacity to cope with, and embrace, necessary change in the Gwydir valley community.

### Regional Development Board - Future Directions for the North West

The Northern Inland Regional Development Board is an independent not-for-profit organization, funded by the NSW Department of State and Regional Development to facilitate and foster economic and regional development projects and activities in the NSW north west region. The Board includes the LGAs of Armidale Dumaresq, Glen Innes Severn, Gunnedah, Guyra, Gwydir, Inverell, Liverpool Plains, Moree Plains, Narrabri, Tamworth Regional, Tenterfield, Uralla and Walcha Councils. Its priorities and projects for the future include:

- Farm forestry development
- Viticulture development
- Arts as an industry
- Skilled migration to the region
- Education export sales

The Board's priority is the diversification and growth of the region's economic base.

### Moree Plains Shire Council – Economic Development Strategy

The Moree Plains Economic Development Strategy identifies the major areas for attention and effort over the next 25 years. It incorporates:

- Business expansion/retention
- Business attraction, particularly from coastal and metropolitan areas in relation to transport infrastructure development eg inland rail, rail/road interchange and airport extension
- Growth and development of the Spa industry in alignment with the Tourism Strategy and into the sport, health and aged care sectors
- Diversification of the agricultural base, including Precision Agriculture and sustainability

Some of the projects currently being investigated or subject to funding applications or Development Assessment are:

- Establishment of a Discount Department Store Shopping Complex
- Artesian spa industry development
- Australian Centre for Sustainable Agriculture
- Freight Hub (Intermodal Terminal)
- Soy flour processing mill (under construction)

This plan was accessed through the Moree Plains Shire Council website (www.mpsc.nsw.gov.au) and was prepared in March 2005.

### Overview

Future developments will focus on resource sustainability, agricultural efficiency, capacity building and diversification of the region’s economic base.

## References


Australian Bureau of Agricultural & Resource Economics (data on relevant agricultural enterprises) www.abare.gov.au.

ABS (1997), Australian National Accounts: Input-Output tables 1996/97

ABS (1999), New South Wales Regional Statistics NSW Cat No 1304.1

ABS (various issues), Regional Statistics NSW Cat No 1362.1

ABS (2006), Water Use on Australian Farms 2004-05, Catalogue number 4618.0

ACIL (2002), "Economic impacts of the draft water sharing plans: an independent assessment for the NSW Department of Land and Water Conservation". A report prepared by ACIL Consulting, September 2002.

BDA Group (2006), Economic Impacts of NSW Government Water Purchases for the Environment, paper prepared for the NSW Natural Resources Commission.

Boyce & Co Chartered Accountants (2006), Australian Cotton Comparative Analysis 2005 Crop prepared for Cotton Research and Development Corporation

Centre for International Economics (2004), Implications of water reforms for the national economy, prepared for the National Program for Sustainable Irrigation, Land and Water Australia

Cotton Australia (2007), Water and Cotton Facts, last updated 13 February 2007

CEEWPR (2000), "Gwydir Valley strategic planning study: regional profile". Report by *the* Centre for Ecological Economics and Water Policy Research (CEEWPR) University of New England.

CEEWPR (2001), "A strategic plan and risk management strategy for sustainable development of the resources of the Gwydir Valley". Preliminary report by the Centre for Ecological Economics and Water Policy Research (CEEWPR) University of New England.

DIPNR (2004), "A Guide to the Water Sharing Plan for the Gwydir Regulated River Water Source". Report by NSW Department of Infrastructure and Natural Resources, July 2004.

Department of Mineral Resources NSW (2003), Mineral Projects in NSW Map, Map Scale 1:1,500,000.

Hassall & Associates (1995), Economic Impact of Interim River Flow Objectives – Gwydir River Catchment.  Prepared for the NSW EPA.

Hope, M. and Bennett, R. (2003), "Gwydir catchment irrigation profile". Report by the Water Use Efficiency Unit – Government joint initiative between NSW Agriculture and the Department of Sustainable Natural Resources.

Letcher, RA and P Aluwihare. (2004), Development of a Decision Support System for the Namoi and Gwydir Valleys. Proceedings of the International Congress on Modelling and Simulation (MODSIM03), Townsville, QLD, pp. 1649-1654.

Natural Resources Commission (2006), "Potential impacts of Governments purchasing water for the environment". Natural Resources Commission, Sydney NSW, December 2006.

Morison M and Bennett J (1997), Water Use Trade-offs in the Macquarie and Gwydir Valleys, Choice Modelling Research Reports.

Peterson, Dwyer, Appels, and Fry (2004), Modelling water trade in the southern Murray-Darling Basin, Productivity Commission Staff Working Paper, Melbourne, November.

Powell, R. and Chalmers, L. (ca 1995), “Gwydir Valley cotton and drought study”, Report prepared for the Gwydir Valley Cotton Growers’ Association, Centre for Agricultural and Resource Economics, University of New England.

NSW Irrigators’ Council Fact Sheet accessed April 2007 at: www.nswirrigators.org.au

Scott, B.W., Dudley, N.J. and van der Lee, J.J. (1996), The impact of interim river flow objectives on irrigation production revenues in the Gwydir and Namoi Valleys: Final Report, Report submitted to the NSW Environment Protection Authority, Centre for Water Policy Research, University of New England.

Wolfenden, J.A.J. (2002), “Some Social and Economic Issues Stemming from Water Reform Processes in Cotton Growing Areas of Australia”, Invited paper to 11th Australian Cotton Conference, Brisbane.

Wolfenden, J.A.J., Gill, R.A. and van der Lee J.J. (2001), “A social and economic assessment of the likely impacts resulting from changes in irrigation water allocations in the Gwydir Valley”. A report presented to the Gwydir Regulated River Management Committee on behalf of the Gwydir Valley Irrigators’ Association.

Woodlock, A. (1996), “The impacts of interim river flow objectives on the agricultural economy of the Gwydir Region”. A report submitted to the River Flow Objective Working Group, Department of Land and Water Conservation, Parramatta.

UNE, Gwydir Valley strategic planning site, www.une.edu.au/cwpr/Gwydir/index.html

NSW Department of Primary Industries (information on irrigated agriculture, regions and socio-economic assessment of water reforms) www.agric.nsw.gov.au.

Potential unpublished and informal sources of information in e.g. APAIS: Australian Public Affairs Information Service; AANRO: Australian Agriculture and Natural Resources Online; Agriculture and Natural Resources Index and Archive; Australian Social Science Data Archive (ASSDA)