The world's languages are facing an even more devastating mass extinction over the next century than its animal and plant species. Linguists predict that between 40 and 90 per cent of the 6,000 or so human languages will die out, as people choose to speak instead in the languages of mass communication such as English, Spanish, Chinese and Arabic.

The wider scientific community has recently begun to respond to the linguists' alarm calls as researchers come to realise that, besides the linguistic and cultural loss, many fields of science - from evolutionary biology and anthropology to ecology and neuroscience - will be impoverished.

At the same time new funding is enabling researchers to record and analyse endangered languages, using the latest audiovisual and computer technologies. This week, for example, the £22.5m Hans Rausing Endangered Language Project opened at the School of Oriental and African Studies in London.

"It is difficult to overstate the importance to science of documenting endangered languages," says David Harrison, an expert in Siberian languages at Swarthmore College in Pennsylvania. "Each language that vanishes without being documented leaves an enormous gap in our understanding of some of the many complex structures the human mind is capable of producing." Prof Harrison has been studying two peoples living in remote parts of Siberia, the Middle Chulym and the Tofa. In each case younger people speak Russian only and there are about 40 fluent native speakers - all middle-aged or elderly - left in a population of several hundred.

The Chulym and Tofa languages contain "complex cognitive structures" not found elsewhere, he says. They also embody a rich pre-literate oral tradition and a highly specialised knowledge of the environment - medicinal plants, animal behaviour, weather signs, hunting and gathering techniques.

The Chulym people are traditional reindeer herders and their language contains a complex verbal system for classifying the deer. "It is most unlikely that this knowledge will be carried over when they switch to Russian," Prof Harrison says.

No one knows how many languages are on the brink of extinction. This is partly because the necessary linguistic research has not yet been carried out - Middle Chulym, for example, was not known to the scientific community until Prof Harrison visited Siberia last year - but more fundamentally because there is no clear point at which dialects diverge into distinct languages.

Politics as well as science still comes into play when linguists define and count languages, says Laurence Horn, professor of linguistics at Yale University, quoting the Yiddish quip made by Max Weinreich in 1945: "A shprakh iz a diyalek mit an army un a flot" (A language is a dialect with an army and a navy). For example, he says, the national Scandinavian languages - Norwegian, Swedish and Danish - are mutually more intelligible than many disappearing "dialects" within African languages.
The most widely quoted figure for the total number of languages spoken today - 6,800 - comes from the Ethnologue database maintained by SIL International, a linguistic research organisation with roots in Christian missionary work and Bible translations.

Of these, 417 are classified as "nearly extinct" because "only a few elderly speakers are still living". In dozens of cases, where just one or two fluent speakers remain, the language has in reality been extinct as a living medium of discourse for several years.

Most of the nearly extinct languages in the Ethnologue are spoken by indigenous peoples in the Americas and Australia. But this may be because more fieldwork has been done there than in Papua New Guinea, which may be the most linguistically diverse country on earth, with more than 800 languages.

Although any extinction is a loss to science, some rare languages are more valuable than others. There is a particular effort now to study the diverse family of about 30 "click" languages, spoken by 120,000 people in southern Africa, which are spoken very fast and punctuated with extraordinary sucking and clicking sounds.

Recent linguistic and genetic analysis suggests that click languages may be the closest living descendants of the ancestral human language that developed on the African savannah more than 100,000 years ago. Much more research will be needed, however, to prove this tantalising idea; time is short, as the click speaking groups are vulnerable peoples living as traditional hunters or gatherers, and many of their languages are endangered, if not on the brink of extinction.

Other endangered languages express unusual grammar, challenging Noam Chomsky's famous assertion 50 years ago that a universal grammatical structure is hard-wired into the human brain. For instance, the 300 Hixkaryana people in Brazil use a sentence structure in which the object comes first, verb second and subject last - an order that linguists would until recently have said was generally prohibited.

A few languages appear to make no verbal distinction between the familiar parts of speech. Words can serve interchangeably as nouns, adjectives and verbs but the meaning is clear from the context.

Languages may also reflect surprising differences between the way people see the world. Steven Levinson of the Max Planck Institute for Psycholinguistics in Nijmegen, the Netherlands, has found an endangered Australian language in which people use the spacial concepts of north, east, south and west - rather than left, right, front and back - to describe their immediate surroundings and body parts.

What we call our left hand would be our south, west, north or east hand in Guugu Yimithirr, depending on position. As Prof Levinson points out, this requires continual awareness of one's surroundings, which would be quite beyond anyone living in an industrialised society.

The cost of linguistic extinction in lost human diversity is only now becoming apparent, as scientists race to document languages before they die - at an average rate of one per fortnight. Then, if a language cannot be saved, at least part of its cultural and scientific heritage will live on.
MULTILINGUALISM CAN COUNTER THE DOMINATION OF THE LANGUAGES OF POWER AND PRESTIGE Languages have been developing and disappearing throughout human history. The first documented wave of extinction occurred around the Mediterranean between 100BC and 400AD. The number of languages in the region fell from about 60 to 10, as people turned to Latin and Greek, the languages of government, commerce and culture in the Roman Empire, says Andrew Dalby, author of Language in Danger, one of a string of popular books published recently about disappearing languages. Something similar is happening now on a global scale, writes Clive Cookson. Speakers of tribal and minority languages are abandoning them in favour of English and the big regional and national languages such as Chinese, Spanish, Portuguese, Hindi/Urdu, Arabic and Russian. The brutal policies that many countries used to suppress minority languages - forcing children to learn only the national language at school and punishing those who spoke their indigenous language - were largely dropped in the late 20th century. Today most governments officially support linguistic diversity. But the devastating psychological effects of past policies will last for generations, as formerly repressed groups feel ashamed of speaking what they regard as an inferior language. David Harrison at Swarthmore College, Pennsylvania, says the Middle Chulym of Siberia "definitely have an inferiority complex about their language". This showed up when someone devised a writing system for Middle Chulym and used it to keep a journal. He was ridiculed by other members of the community and gave up the project. The main force driving language extinction today is economic globalisation, says Stephen Anderson, linguistics professor at Yale University. "There is a general assumption that you have to adopt a language of power and prestige," he says. "Of course, you need to speak English in the US to participate in the economy and culture but that does not exclude speaking another language. The natural condition of the world is multilingualism." Most linguists believe the salvation for endangered languages is to encourage their speakers to become multilingual - or at least bilingual, maintaining their traditional tongue while becoming fluent in an international language. In the recent past bilingualism has often been a step towards extinction; the aim now is to achieve "stable bilingualism", by giving people enough pride in their language to keep it alive.

"We want people to make an informed decision," says Paul Austin, director of the Hans Rausing Endangered Language Project. "They should know how grateful future generations will be if they keep teaching their children and grandchildren to speak their own language."